Civil & Environmental Consultants, Inc.

April 9, 2025 *Revised June 12, 2025* 

Mr. Phillip Grooms, City Manager City of Mount Pleasant 100 Public Square Mount Pleasant, TN 38474

Dear Mr. Grooms:

Subject: Proposal for Engineering Services Infrastructure Planning Grant – Zone Meter Implementation CEC Project 345-370

#### 1.0 BACKGROUND

Civil & Environmental Consultants, Inc. (CEC) is pleased to provide the City of Mount Pleasant (City) with this proposal for Zone Meter Implementation (meter) at locations in the water distribution system. This project is funded by an Economic and Community Development – Infrastructure Planning Grant.

After preliminary meetings with the City, the general meter locations in the attached 90% plans were selected and approved by the City. Meters in these locations are intended to divide the system into several distinct water loss zones that can be used to evaluate water loss in each zone. Evaluating flow through a zone meter in comparison to water sold in the zone, or an increase in flow above a typical flow through the meter, can be used as data points by the City as part of their planning efforts or to recognize and consider corrective solution.

On January 22, 2025, CEC met on-site with the City and our subcontractor, Underground Pipe and Construction, LLC (UPC). Prior to the meeting, the City made an 811 call to have subsurface utilities marked. At the meeting, we visited each of the proposed locations, and several alternate locations. The 90% plans were revised based on our observations and feedback from UPC and the City. The result of this effort was shared with the City and UPC for review. Review comments were addressed, and the 90% plans were updated.

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#### 2.0 <u>SCOPE OF SERVICES</u>

CEC proposes to complete the following Scope of Services based on our understanding of the project as summarized above.

1. CEC will develop plans for six zone meters as shown on the attached 90% plans. The six meters are numbered as follows:

Meter Number	Meter Name	Meter Size
1	Joy Road	4-inch
2	Mt. Joy	4-inch
3	Dry Creek	4-inch
4	S. Cross Bridges	4-inch
5	S. Canaan	4-inch
6	N. Canaan	4-inch

- a. CEC will develop final plans, a narrative for the project, and will make a Drinking Water Engineering Plan Submittal on behalf of the City to the Tennessee Department of Environment and Conservation, Division of Water Resources -Engineering Services Unit (TDEC DWR ESU). The lump sum fee for this task includes the associated review fee of \$100.
- 2. CEC's team includes UPC, who will install the zone meters. UPC is a Tennessee, Municipal and Utility Construction licensed Contractor.
- 3. CEC will provide support services during installation of the zone meters. These services are limited to 12 hours of coordination and communication time with Owner and Subcontractor, a kick-off meeting prior to construction start, three site visits during construction, and a final site visit at the conclusion of meter installation.
- 4. The excavating contractor is responsible for Tennessee 811 notification. CEC, through UPC, will initiate a Tennessee 811 notification at least 3 working days prior to excavation. The purpose of the notification is for each utility operator to locate their utility for the contractor's information prior to excavation. If a utility operator fails to locate its facilities within three (3) working days in the manner required by the 811 law

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after receiving proper notification, and the utility is damaged from excavation as result of the utility operator's failure to properly locate, CEC and UPC shall not be liable for the damage. If existing utilities have been located in the project work area and it is mutually agreed upon that the work be completed, CEC may request the City's support in hydrovacuuming areas of concern.

CEC's proposed Scope of Services assumes that the City will:

- 1. Field verify the size and type of each existing pipeline shown on the attached 90% plans.
- 2. Field verify that each of the existing valves shown on the 90% plans operates properly and does not leak.
- 3. Excavate to a minimum depth of 4'6" in the location of each meter to confirm the absence of rock.
- 4. Assist UPC in shutting down lines as needed for UPC to complete the project as operation of existing valves should be performed by City

The identified responsibilities of the City are critical for completion of the project as it has been defined.

#### Assumptions:

- 1. Automatic Meter Reading (AMR)/Advanced Metering Infrastructure (AMI) endpoints are included in CEC's Scope of Services, but programing of the endpoints to connect to the AMR/AMI system is not (assume by others). The endpoints will be compatible with the Neptune R900 system.
- 2. The size and type of each pipe is based on information provided by the City and was used to prepare the 90% plans. If it is determined the size or materials are different, a contract fee adjustment may be necessary to make a proper installation.
- 3. The valves shown in the 90% plans operate properly and do not leak; otherwise, there will be additional costs to purchase and install new valves to replace the faulty valves.
- 4. If rock is present shallower than 4'6" in the location of a proposed meter, and the rock based on the UPC's judgement cannot reasonably be removed without the use of an

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excavator-mounted hydraulic hammer (commonly referred to as a hoe-ram), additional costs to remove the rock will be incurred.

- 5. As-built drawings will not be required. It is understood that the City will map the proposed infrastructure as it is installed.
- 6. The 90% plans will not need to be changed substantially during the TDEC review process. This scope, budget, and schedule are based on the 90% plans; CEC will provide an updated Scope of Services, cost estimate, and schedule if the 90% plans require later revision.
- 7. That attached meter, vault, and lid submittals are acceptable to the City.
- 8. Since the proposed work is adjacent to existing waterlines, it is assumed that permits for work in the right-of-way will not be required, and easements for existing infrastructure outside of the right-of-way already exist and can be used for the proposed infrastructure. If permits or easements are required, CEC understands that the City will obtain the permits or easements. CEC is available to assist the City in obtaining permits/easements; however, this assistance is outside of our Scope of Services and will be invoiced to the City on a time and materials basis.

#### 3.0 ESTIMATED SCHEDULE

Task	Start	Complete	Notes
Present This Proposal to Mount Pleasant for approval	June 12, 2025	June 17, 2025	
Regulatory Review	July 2025	September 2025	Regulatory approval is outside of CEC's control and may take longer than estimated.
Material Waiting Period	June 2025	January 2026	Estimated 28-week lead time on materials. This is outside of CEC's control.
Pre-Construction Conference	January 2026		
Meter Installation	February 2026	April 2026	Construction scheduling subject to change based on weather, or other unforeseen circumstances.

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#### 4.0 <u>LUMP SUM FEE</u>

Item	Description	Lump Sum Fee
1	Engineering Services and Installation Support for meters 1-2	\$167,000
2	Engineering Services and Installation Support for meters 1-3	\$228,000
3	Engineering Services and Installation Support for meters 1-4	\$290,000
4	Engineering Services and Installation Support for meters 1-6	\$413,000

#### 4.1 Potential additional costs

5	Rock Excavation Equipment Mobilization (Lump Sum)	\$11,000
6	Rock Excavation for a 4" Meter (Each)	\$13,200
7	Additional Engineering Services or Construction Changes	Per attached rate sheet

Note: Should additional costs outside of the Scope of Services listed above be incurred, CEC will provide the City with a change order for additional services outside of the Scope of Services presented herein.

#### 5.0 TERMS AND AGREEMENT

CEC's Schedule of Terms and Conditions, which governs the proposed work, is attached. CEC's proposal is valid for thirty (30) days from the date of the proposal, after which time the validity may only be extended with CEC's consent. CEC reserves the right to revise, adjust, or withdraw this proposal if not accepted by the City within thirty (30) days of the date of the proposal. Your written acceptance below will form a binding contract pursuant to the attached Terms and Conditions. The individual signing below warrants that they have authority to sign and execute this Agreement on behalf of the City of Mount Pleasant.

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#### 6.0 <u>CLOSING</u>

CEC appreciates the opportunity to provide this proposal to the City of Mount Pleasant. If you have any questions about this proposal, please feel free to contact us at 615-333-7797.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Peter Chimera, P.E. Project Manager

Enclosures: CEC Terms and Conditions 90% Plans Meter, Vault, and Lid Submittals

Copy: Dale Brown, Public Works Director Ted Howell, Assistant City Manager

CEC Project 345-370, dated June 12, 2025 ACCEPTED BY: City of Mount Pleasant

Signature:	Date:	
Name:	Title	

Acceptance of Scope:

Selection	Lump Sum Fee	Accepted by Owner (Select One Option)
Engineering Services and Installation Support for Meters 1-2	\$167,000	
Engineering Services and Installation Support for Meters 1-3	\$228,000	
Engineering Services and Installation Support for Meters 1-4	\$290,000	
Engineering Services and Installation Support for Meters 1-6	\$413,000	

Ricky Oakley, P.E. Principal



The following terms and conditions ("TERMS") shall apply to and are an integral part of the attached proposal ("PROPOSAL") between Civil & Environmental Consultants, Inc. ("CEC") and the client ("CLIENT") named in the attached PROPOSAL. CLIENT's acceptance of the PROPOSAL includes acceptance of these TERMS and acceptance of this PROPOSAL shall form the entire agreement between the parties ("AGREEMENT"). In the event of a conflict or inconsistency between these TERMS and the PROPOSAL, these TERMS shall take precedence. Acceptance of the AGREEMENT by CLIENT will occur when CLIENT directs CEC, orally or in writing, to commence performance of its services.

#### 2. STANDARD OF CARE

CEC shall perform its services consistent with the professional skill and care ordinarily provided by professionals, such as CEC, practicing in the same or similar locality under the same or similar circumstances and in effect at the time of performance. CEC provides no warranties or guarantees whether express or implied.

### 3. SITE ACCESS, SITE CONDITIONS AND SUBSURFACE FEATURES

CLIENT will grant or obtain free access to the site for all equipment and personnel for CEC to perform the services set forth in this AGREEMENT. CEC will take reasonable precautions to limit damage to the site, but it is understood by CLIENT that, in the normal course of the services, some damage may occur and the correction of such damage is not part of this AGREEMENT unless so specified in the PROPOSAL.

The CLIENT is responsible for the accuracy of locations for all subsurface structures and utilities. CEC will take reasonable precautions to avoid known subsurface structures, and the CLIENT waives any claim against CEC arising from damage done to subsurface structures and utilities not identified or accurately located. In addition, CLIENT agrees to reimburse CEC for time and expenses incurred by CEC in defense of any such claim based upon CEC's current fee schedule and expense reimbursement policy.

CEC may, but is not required to, undertake an investigation to locate any utilities, structures or materials as CEC deems prudent. Such investigation by CEC shall not impose any additional obligation or liabilities on CEC and CLIENT agrees that such investigation, if undertaken, is for CEC's convenience only.

The CLIENT recognizes that subsurface conditions may vary from those observed at locations where borings, surveys, or explorations are made, and that site conditions may change with time. Data, interpretation, and recommendations by CEC will be based solely on information available to CEC. CEC is responsible for the data, interpretations, and recommendations based on its services, but will not be responsible for other parties' interpretations or use of the information developed.

#### 4. BIOLOGICAL POLLUTANTS, HAZARDOUS MATERIALS AND HAZARDOUS CONDITIONS

CLIENT warrants that a reasonable effort to investigate and inform CEC of known or suspected Biological Pollutants, Hazardous Materials and hazardous conditions on or near the site has been made by the CLIENT. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the by-product of any such biological organisms. The term "Hazardous Materials" shall mean any toxic substances, chemicals, pollutants, or other materials, in whatever form or state, including but not limited to smoke, vapors, soot, fumes, acids, alkalis, minerals, toxic chemicals, liquids, gases or any other material, irritant, contaminant or pollutant, that is known or suspected to adversely affect the health and safety of humans or of animal or plant organisms, or which are known or suspected to impair the environment in any way whatsoever. Hazardous Materials shall also include, but not be limited to, those substances defined, designated, or listed in Section 404 of the Solid Waste Disposal Act (42 USC Subsection 6903); Section 9601(14) of the Comprehensive Environmental Response, Compensation and Liability Act (42 USC Subsection 9601(14)); as listed or designated under Sections 1317 and 1321(b)(2)(a) of the Title 33 (33 USC Subsections 1317 and 1321(b)(2)(a)); or as defined, designated, or listed under any other federal, state, or local law, regulation or ordinance concerning hazardous wastes, toxic substances, or pollutants.

CEC and CLIENT agree that when unanticipated or suspected Biological Pollutants, Hazardous Materials and/or hazardous conditions are encountered it

may be necessary for CEC to take immediate measures to protect health and safety. CEC agrees to immediately notify CLIENT when unanticipated or suspected Biological Pollutants, Hazardous Materials and/or hazardous conditions are encountered. CLIENT agrees to make any disclosures required by law to the appropriate governing agencies. In the event the site is not owned by CLIENT, CLIENT recognizes that it is the CLIENT's responsibility to inform the property owner of the discovery of unanticipated or suspected Biological Pollutants, Hazardous Conditions.

Notwithstanding any other provision of the AGREEMENT, CLIENT waives any claim against CEC for injury or loss arising from CEC's discovery of unanticipated or suspected Biological Pollutants, Hazardous Materials and/or hazardous conditions. CLIENT will be responsible for ultimate disposal of any samples secured by CEC which are found to be contaminated with Biological Pollutants and/or Hazardous Materials.

Nothing contained in this AGREEMENT shall be construed or interpreted as requiring CEC to assume liability for the generation, transportation, treatment, storage and/or disposal of hazardous waste within the meaning of the Resource Conservation and Recovery Act of 1976, as amended, or within the meaning of any similar federal, state, or local regulation or law.

If during remediation and/or construction activities waste manifests are required, CLIENT shall provide an authorized person to sign manifests or will provide CEC with a written limited power of attorney or agency agreement to sign manifests on CLIENT'S behalf.

#### 5. EVOLVING TECHNOLOGIES

Services such as those provided by CEC may involve technologies which are new or emerging and these technologies may supersede current techniques. In addition, standards for our services, including statutes and regulations, may change with time. CLIENT understands that CEC's recommendations and/or services must be based upon the current Standard of Care utilizing established technologies and standards excluding new or emerging technologies unless agreed to by both parties in writing.

#### 6. SAMPLE DISPOSAL

CEC will provide storage for samples collected for sixty (60) days. Further storage or transfer of samples can be made at CLIENT's expense and upon prior written request.

#### 7. SAFETY/CONSTRUCTION OBSERVATION

CLIENT, its contractor or other representatives shall be solely responsible for working conditions on the site, including compliance with OSHA regulations and safety of all persons and property during the performance of the work. CEC will not be responsible for means, methods, techniques, sequences or procedures of construction including, but not limited to safety.

If CEC is retained by the CLIENT to provide a site representative for the purpose of observing specific portions of any construction work as set forth in the PROPOSAL, CEC will report observations and professional opinions. CEC's presence on the site does not in any way guarantee the completion or quality of the performance of the work by any party retained by the CLIENT to provide construction related services. CEC does not have the duty to reject or stop work of CLIENT or its agents unless contractually obligated.

#### 8. BILLING AND PAYMENTS

8.1. General: Invoices will be submitted in accordance with the provisions outlined in the PROPOSAL. Payment is due from CLIENT thirty (30) days from the invoice date. If a retainer or pre-payment is required by the PROPOSAL, payment must be received by CEC prior to commencement of services. Payment shall be made as follows:

Electronic Payment: PNC Bank, Pittsburgh, PA 15222 PNC Bank Routing #043000096 CEC Account #2272405 SWIFT & BIC Code: PNCCUS33 Remittance Detail: accountsreceivable@cecinc.com

Lockbox (regular mail): Civil & Environmental Consultants, Inc. P.O. Box 644246 Pittsburgh, PA 15264-4246



Any retainer shall be applied to the final invoice and unused funds, if any, returned to CLIENT. In the event CLIENT fails to pay CEC within thirty (30) days of invoice, CLIENT agrees that CEC will have the right to suspend performance of services after written notice to CLIENT. CEC will be entitled to interest of one and one half percent (1.5%) per month for past due amounts. CEC will be entitled to collect for time and expenses (per CEC's current fee schedules), and other costs incurred by CEC for collection of past due amounts.

Our PROPOSAL does not include gross receipts taxes, business or occupation taxes or assessments that the municipality where the project is located may assess upon CEC or its subcontractors. If such taxes are or become a liability of CEC, the CLIENT agrees to reimburse CEC at cost.

8.2. Reimbursable Expenses: Direct non-salary expenses (e.g. Travel, Equipment, Subcontractors/Vendors) will be billed according to the terms of our PROPOSAL.

8.3. Litigation Services: If litigation services are not part of the PROPOSAL to which these TERMS are attached and are requested by CLIENT, the scope and fee schedule for the requested litigation services will be identified in a separate PROPOSAL. CLIENT shall reimburse CEC for costs incurred in responding to subpoenas or other legal requests related to the services provided by CEC under this AGREEMENT.

8.4. Design Build: If CLIENT requests CEC to perform design-build services, such services will be performed in accordance with separate TERMS and a PROPOSAL for such design-build services.

#### 9. CHANGES

9.1. Changes: Upon a change in CEC's scope of services or discovery of unforeseen conditions, or any direction or instruction outside of the PROPOSAL, CEC will provide CLIENT with the estimated cost of performing the change and any change in the AGREEMENT schedule. Prior to CEC being required to implement the change, CLIENT shall authorize the requested change either verbally or in writing amending the AGREEMENT price and schedule.

9.2. Unauthorized Changes: If changes are made in CEC work products by CLIENT or persons other than CEC, any and all liability against CEC arising out of such changes is waived and CLIENT assumes full responsibility for such changes unless CLIENT has given us prior notice and has received written consent from CEC for such changes.

#### 10. DELAYS

Delays not due to CEC shall result in an extension of the schedule equivalent to the length of delay. If such delays result in additional costs to CEC, the AGREEMENT price shall be equitably adjusted by the amount of such additional costs.

#### 11. INSURANCE

CEC will maintain Workmen's Compensation Insurance as required by state law, General Liability Insurance for bodily injury and property damage with a limit of \$1,000,000 per occurrence and an aggregate limit of \$2,000,000 and Automobile Liability with a limit of \$1,000,000. Professional liability will be provided with a limit of \$1,000,000 per claim and \$1,000,000 in the aggregate, if applicable. CLIENT and/or the property owner will be listed as additional insured for General Liability Insurance upon CLIENT's written request.

#### 12. ALLOCATION OF RISK

12.1. Limitation of Remedies: CLIENT agrees to limit CEC's liability for any claim arising from, or alleged to arise from any acts, errors or omissions in the performance of services under this AGREEMENT, whether such claim is based in negligence, breach of contract, or other legal theory to an aggregate limit of the amount of fees paid to CEC under this AGREEMENT, except for CEC's willful misconduct or gross negligence.

12.2. Waiver of Consequential Damages: CEC and CLIENT agree to waive any claim against each other for consequential, incidental, special or punitive damages.

12.3. Indemnification: CEC shall indemnify and hold harmless CLIENT from and against any and all claims, damages, or liability to the extent caused by the negligent performance of services under this AGREEMENT by CEC, including injuries to employees of CEC.

#### 13. TERMINATION

This AGREEMENT may be terminated by either party seven (7) days after written notice: i) in the event of breach of any provision of this AGREEMENT; ii) if the CLIENT suspends the work for more than three (3) months in the

aggregate; or iii) for CLIENT or CEC's convenience. In the event of termination for suspension or convenience, CEC will be paid for services performed prior to the date of termination plus reasonable termination and demobilization expenses, including, but not limited to the cost of completing analyses, records and reports necessary to document job status at the time of termination.

#### 14. GOVERNING LAW

The law of the State of Tennessee will govern the validity of these TERMS and the AGREEMENT, their interpretation and performance. If any of the provisions contained in these TERMS and the AGREEMENT are held illegal, invalid, or unenforceable, the enforceability of the remaining provisions will not be impaired.

#### **15. DISPUTE RESOLUTION**

15.1. Notice of Dispute: Within fifteen (15) days of the occurrence of any incident, act, or omission upon which a claim for relief may be based, the party seeking relief shall serve the other party with a written notice specifying the nature of the relief sought, the amount of relief sought, a description of the reason relief should be granted, and the provisions of this AGREEMENT that authorize the relief requested.

15.2. Meet and Confer: Within ten (10) days of receipt of the Notice of Dispute, the parties shall meet and confer in a good faith attempt to resolve the dispute. Participants in the meet and confer must have the authority to enter into a binding resolution on behalf of each party.

15.3. Jurisdiction and Venue: After completion of the meet and confer, either party may proceed to litigation. CEC and CLIENT agree that any court of record in Maury County, Tennessee, shall have the exclusive jurisdiction and venue over any claims relating to or arising under this AGREEMENT.

15.4. Waiver of Jury Trial: THE PARTIES AGREE AND IRREVOCABLY WAIVE THEIR RIGHT TO TRIAL BY JURY IN ANY ACTION, DISPUTE, PROCEEDING OR SUIT RELATING DIRECTLY OR INDIRECTLY TO THIS AGREEMENT OR THE PROJECT.

#### 16. ASSIGNMENT

CLIENT and CEC each binds itself and its successors and assigns to the other and its successors and assigns with respect to all covenants of this AGREEMENT. Neither CLIENT nor CEC shall assign, sublet or transfer any rights under or interest in this AGREEMENT without the prior written consent of the other party. This section shall not, however, apply to subrogation rights (if any) of any insurer of either party.

#### 17. OWNERSHIP

CEC shall have title to all drawings, specifications or other documents ("WORK PRODUCT") furnished to CLIENT and intended for use in connection with projects under this AGREEMENT. CLIENT is granted a limited license to use and reproduce the WORK PRODUCT prepared by CEC for use in the execution of the project(s) under this AGREEMENT. The WORK PRODUCT is not to be used by CLIENT or other contractors, subcontractors, or material suppliers on other projects without the express written consent of CEC.

#### **18. FILE RETENTION**

Upon conclusion of the project, CEC's file on the project will be closed and may be sent offsite for storage. Unless CLIENT requests a longer retention period in writing, CEC reserves the right to destroy all file information seven (7) years after the project is closed.

#### 19. SURVIVAL

In the event of termination, cancellation or avoidance of this AGREEMENT, the terms and conditions of Articles 3 (Site Access, Site Conditions and Subsurface Features), 4 (Biological Pollutants, Hazardous Materials and Hazardous Conditions), 5 (Evolving Technologies), 11 (Insurance), 12 (Allocation of Risk), 14(Governing Law), and 15 (Dispute Resolution) shall survive termination of the AGREEMENT.

#### END OF TERMS

# **CITY OF MOUNT PLEASANT** WATER SYSTEM IMPROVEMENTS **MOUNT PLEASANT, TENNESSEE**

#### **MAY 2025**

**OWNER/TEAM INFORMATION** 

#### **CIVIL ENGINEER & LAND SURVEYOR**

OWNER

CIVIL & ENVIRONMENTAL CONSULTANTS, INC. 117 SEABOARD LANE SUITE E100 FRANKLIN, TN 37067 PH: (615) 333-7797 FX: (615) 333-7751 CONTACT: PETER CHIMERA, P.E.

MOUNT PLEASANT PUBLIC WORKS 100 PUBLIC SQUARE MOUNT PLEASANT, TENNESSEE 38474 PH: 931-379-7717 CONTACT: DALE BROWN, UTILITIES DIRECTOR

#### CONTRACTOR

UNDERGROUND PIPE & CONSTRUCTION, LLC 213 CHURCH ST. DICKSON, TENNESSEE, 37055 PH: 615-446-5446 CONTACT: DANNY WILLIAMS

#### PLANS REVIEWED AND APPROVED BY MOUNT PLEASANT PUBLIC WORKS

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Know what's below. Call before you dig.	TION FOR UNDEROROUND UTUTES, CONTINCTOR CONTONS (HORIZONTAL AND VERTICAL) OF ALL BUT NOT LIMITED TO GAS, WATER, AND SANTARY L RE REPORTED, BAREDATELY, TO THE ENGINEER AND S.	DEC APPRO	OVAL STAMP			
Civil & Environmental Consultants, Inc.	II7 Seaboard Lane Suite E-100 Franklin, TN 37067 Ph: 615.333.7797 www.cecinc.com		CIT WATER ZON MOUN	Y OF MOUN R SYSTEM I IE METER II IT PLEASAN METER L	NT PLE MPRO NSTAL NT, TE AYOU	ASANT VEMENTS LATION NNESSEE
DRAWN BY: DATE: MAY	KSR CHECKED BY: 2025 DWG SCALE:	PEC N.T.S.	APPROVED BY: PROJECT NO:	RGO E 345-370	EXHIBIT:	COVER

Kn

DF DA























BUS: 615 / 242-4286 WATS: 800 / 264-8215 FAX: 615 / 726-1017 PIPE & SUPPLY COMPANY, Inc 1500 COUNTY HOSPITAL ROAD P.O. BOX 280776 NASHVILLE, TENNESSEE 37228

TO: UNDERGROUND CON

ENG: \_\_\_\_

Job: MT PLEASANT WATER SYSTEM

DATE: 3/12/25

Gentlemen:

We are sending you:( ) Literature (X) Shop Draw (X) For Approval

(X) Shop Drawing () For Re-Submission

() Revised Drawings

<b># OF COPIES</b>	MANUFACTURER	DESCRIPTION	PAGE
		<b>CPS COVER SHEET/INDEX</b>	1
1	MANUFACTURING PACKET	2" MT PLEASANT METER ASSY	2-33
1	MANUFACTURING PACKET	4" MT PLEASANT METER ASSY	34-66
1	SMITH BLAIR	665 TAPPING SLEEVE	67-68
1	MUELLER	TAPING VALVE MJXFLG	69-70

#### **Please Return 1 Copy to This Office**

THANK YOU,

By Dalton Jones

PAGE 2

# 2" METER MATERIAL





#### Product: MUNICIPEX® water service pipe

**Date:** 31 March 2022 (supersedes 15 February 2020)

#### CONSOLIDATED PIPE & SUPPLY 1500 COUNTY HOSPITAL ROAD NASHVILLE TN, 37218



## MUNICIPEX<sup>®</sup> water service pipe

Article no.	Nominal diameter in	Average OD A In (mm)	Wall thickness B In (mm)	Weight Ib/ft (kg/m)	Capacity gal/ft (l/m)
		0.875	0.097	0.10	0.0189
261056	3/4	(22.22)	(2.47)	(0.15)	(0.2356)
		1.125	0.125	0.17	0.0316
261076	1	(28.582)	(3.18)	(0.26)	(0.3939)
		1.375	0.153	0.25	0.0467
261096	1 1/4	(34.92)	(3.88)	(0.37)	(0.5827)
		1.625	0.181	0.35	0.0650
261116	1 1/2	(41.28)	(4.59)	(0.52)	(0.8118)
	_	2.125	0.236	0.60	0.1114
261136	2	(53.98)	(6.00)	(0.90)	(1.3906)

#### TECHNICAL DESCRIPTION

Specification	English	SI	Standard
Minimum Density	58 lb/ft <sup>3</sup>	926 kg/m³	ASTM F876
Minimum Degree of Crosslinking	70%	70%	ASTM F876
Max. Thermal Conductivity	2.84 Btu in/(ft <sup>2</sup> °F hr)	0.41 w/(m°K)	DIN 16892
Coefficient of Linear Expansion	9.33 x 10-4 in/ft°F @ 68°F 1.33 x 10-3 in/ft°F @ 212°F	0.14 mm/(m°C) @ 20°C 0.2 mm/(m°C) @ 100°C	Mean @ 20-70°C per DIN 16892
Modulus of Elasticity	87,000-130,500 psi @ 68°F 43,500-58,000 psi @ 176°F	600-900 N/mm² @ 20°C 300-400 N/mm² @ 80°C	Minimum @ 20°C per DIN 16892
Tensile Strength	4,194-4,355 psi @ 68°F 2,610-2,900 psi @ 176°F per ASTM D638	26-30 N/mm <sup>2</sup> @ 20°C 18-20 N/mm <sup>2</sup> @ 80°C per ASTM D638	
IZOD Impact Resistance	No Break	No Break	
Temperature Working Range	-40 to 200°F	-40 to 93°C	
Roughness	e=0.00028 in	e=0.007 mm	
Max. Short-term Exposure	150 psig @ 210°F (48 hr)	1035 kPa @ 99°C (48 hr)	ASTM F876
UV resistance	See T	B218	ASTM F2657



#### FUNCTIONAL DESCRIPTION

PAGE 4

FHAII

MUNICIPEX water service pipe is manufactured using the high-pressure peroxide extrusion method for crosslinked polyethylene (PEXa). MUNICIPEX water service has a co-extruded blue PE shield that protects the pipe against ultraviolet light (sunlight) for an extended time. MUNICIPEX water service pipe meets or exceeds the requirements of ASTM F876, CSA B137.5 and PPI TR-3, and is certified to NSF Standards 14/61 and AWWA C904. MUNICIPEX water service meets the requirements of ASTM F2023 for chlorine resistance. MUNICIPEX water service is manufactured by REHAU using a quality management system which has been certified to the latest version of ISO 9001.

MUNICIPEX water service is produced in SDR9 copper tube sizes (CTS) so that it is compatible with AWWA C800 valves and fittings when used with manufacturer's recommended insert which is required to stiffen the pipe. MUNICIPEX water service can also be used with the EVERLOC+<sup>®</sup> compression-sleeve system certified to ASTM F877. See Technical Bulletin 261 for other compatible PEX fitting systems

#### LONG-TERM STRENGTH

The maximum temperature and pressure ratings of the MUNICIPEX water service are in accordance to ASTM F876, CSA B137.5 and PPI TR-3. The designer shall determine the actual conditions and apply the appropriate and additional design factors as required for any particular project. The temperature and pressure ratings apply to the application of MUNICIPEX water service for conveying hot and cold water at the 2.0 safety factor on allowable working pressure according to ASTM and CSA. REHAU confirms a 200 psi (1380 kPa) pressure rating at 73.4°F (23°C) when using a 1.5 safety factor, see REHAU *Technical Bulletin 239 MUNICIPEX Pressure and Temperature Ratings*. According to the REHAU *PEXa Limited Warranty*, the MUNICIPEX water service warranty period of 25 years is for operating conditions at or below 180°F (82.2°C) in permitted applications when the handling, use, installation and maintenance continually complies with all REHAU technical guidelines.

MUNICIPEX water service pipe SDR9	
maximum pressures and temperatures	design factors
200 psi @ 73.4°F (1380 kPa @ 23°C)	0.63 (per CSA B137.0 clause 6.6.3.2.2, REHAU TB239)
160 psi @ 73.4°F (1055 kPa @ 23°C)	0.50 (per ASTM F876, CSA B137.5)
100 psi @ 180°F (690 kPa @ 82.2°C)	0.50 (per ASTM F876, CSA B137.5)

# **PRO-TRACE® COPPER** PE30

Copper Tracer Wire • Oxygen Free Copper • Dead Soft Annealed Copper Conductor • Corrosion Resistant High-Density, High Molecular Weight Polyethylene (HDPE) Insulation • Moisture, Chemical, and Oil Resistant Impact, Crush, and Abrasion Resistant • RoHS Compliant • Direct Burial Rated • 30 Volts • Made in the USA



#### **Applications and Information**

- PRO-TRACE 
   COPPER PE30 is used for tracer wire applications to conductively locate
   buried utility lines for the gas, water, sewer, telecommunication, and electrical markets.
- 30 mil, High-Density, HMWPE insulation provides excellent oxidative stability, toughness, abrasion, crush, chemical, oil, and moisture resistance. Provides superior long term aging performance with excellent environmental and thermal stress-cracking resistance.
- Available in 30 mil (30v) and 45 mil (600v) insulation for desired level of protection, but we <u>only</u> recommended 45 mil version when boring for extra abrasion protection.
- Environmentally friendly and RoHS compliant
- **Recommended**: Tracer-Lock<sup>®</sup> Connector #TL-LUG-SS. Is performs Main-to-Main <u>or</u> Main-to-Service connections without cutting or stripping, saving time and labor costs.
- Recommended: Pro-Trace<sup>®</sup> Grounding Mag Rod #PTANODE12. It provides far-end grounding to utilize 512 Hz or 8 kHz with pin-point accuracy and corrosion protection.

#### **Standards and References**

**PRO-TRACE COPPER PE30** meets or exceeds all applicable UL Standards, ASTM specifications, and requirements of the National Electrical Code.

- ASTM B-3: Standard Specification for Soft or Annealed Copper Wire.
- ASTM B170: Standard Specification for Oxygen-Free Electrolytic Copper.
- ASTM D1248: Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable.

#### Construction

**PRO-TRACE © COPPER PE30** is made from oxygen free copper cathode formed into copper rod. Copper rod is pulled thru a series of drawing dies to acheive conductor diameter. Conductor then undergoes a heat treating process (annealing), resulting in soft annealed copper. The process above is what determines properties like break load and flexbility.

The next process is extrusion of the insulation, high-density, high molecular weight polyethylene (HMW-HDPE) spark test 5,000 VAC. HDPE is considered the best tracer wire insulation due to cost, smoothness, and abrasion protection. The final process is processing insulated wire onto reels.

#### **Specification Example**

Tracer wire shall be a **#12 AWG SOLID PRO-TRACE COPPER PE30**. Tracer wire shall consist of a soft-drawn, oxygen free copper conductor with a minimum break load of 197 lbs. Conductor shall be extruded with a 30 mil, high density, high molecular weight polyethylene (HMW-HDPE) persuant to ASTM D1248. Tracer wire shall be rated for direct burial use at 30 volts and RoHS compliant. Tracer wire shall be as manufactured by Pro-Line Safety Products or approved equal and made in the USA.

**Tracer-Lock Connectors** shall be used for connecting Main-to-Main <u>or</u> Main-to-Service (Part #: TL-LUG-SS) to ensure reliable installation, electrical continuity throughout the tracer wire system and protection from corrosion.

Specification Updated: 4.14.2020 (PRO-TRACE COPPER PE30-v1)

PRO-TRACE® is a registered trademark of Pro-Line Safety Products Co.

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**TRACER WIR** 

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COPPER

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PRO-TRAC

TRACER WIRE 5

#### TABLE 1: CONDUCTOR (Physical, Mechanical and Electrical Properties)

PROPERTY	14 AWG	12 AWG	<b>10 AWG</b>	8 AWG
Conductor Type	Copper	Copper	Copper	Copper
Conductor Temper	Soft-Drawn	Soft-Drawn	Soft-Drawn	Soft-Drawn
Rated Break Load	124 lbs	197 lbs	313 lbs	479 lbs
Rated Tensile Strength	38,500 psi	38,500 psi	38,500 psi	37,000 psi
Elongation	3.0%	5.0%	5.0%	5.0%
Nominal DC Resistance	2.525 ohms	1.588 ohms	0.999 ohms	0.628 ohms

#### TABLE 2: INSULATION (Physical, Mechanical and Electrical Properties)

PIPE & SUPPLY COMPANY, INC. 1500 County Hospital Rd. Nashville, TN 37218

TEST DESCRIPTION	ASTM STANDARD	TYPICAL VALUES
Density @ 23°C	ASTM D792	0.945 g/cm <sup>3</sup>
Melt Flow Rate	ASTM D1238	0.8 g/10 min
Tensile Strength	ASTM D638	3,400 psi
Tensile Strength Retention	ASTM D638	90% after 48 hours @ 100°C
Tensile Elongation	ASTM D638	500%
Tensile Elongation Retention	ASTM D638	90% after 48 hours @ 100°C
Environmental Stress Cracking	ASTM D1693	0 failures @ 48 hours
Thermal Stress Cracking	ASTM D2951	0 failures @ 96 hours
Brittleness Temperature / Failures	ASTM D746	0 failures @ -76° C
Melting Point	ASTM D3418	130°C
Oxidative Induction Time	ASTM D3895	170 min @ 200°C
Dielectric Constant	ASTM D1531	2.32 @ 1 MHz
Dissipation Factor	ASTM D1531	0.00006 @ 1 MHz
DC Volume Resistivity Test @ 23°C	ASTM D257	> 1 x 10 <sup>15</sup> ohm-cm

#### TABLE 3: ORDERING INFORMATION (Weights, Measurements, and Packaging)

PRODUCT PART NO.	AWG SIZE / PRODUCT DESCRIPTION	UCT BREAK STRENGTH (Ibs)		FINISHED O.D. (Nominal)	INSULATION THICKNESS (Nominal)	PRODUCT WEIGHT LBS/1000'	STANDARD LENGTHS
	(SOLID) PRO-1	RACE® COP	PER PE30 TF	ACER WIR	RE (30 mil/3	0V)	
74003.XXXX	14 AWG SOLID COPPER PE30	124 lbs	0.0641"	0.124"	0.030"	16.0	500', 1000', 2500', 5000'
74004.XXXX	12 AWG SOLID COPPER PE30	197 lbs	0.0808"	0.141"	0.030"	24.0	500', 1000', 2500', 5000'
74005.XXXX	10 AWG SOLID COPPER PE30	313 lbs	0.1019"	0.162"	0.030"	37.0	500', 1000', 2500', 5000'
74006.XXXX	8 AWG SOLID COPPER PE30	479 lbs	0.1285"	0.189"	0.030"	62.0	500', 1000', 2500', 5000'
	(STRANDED) PR	O-TRACE® CO	OPPER PE30	TRACER V	VIRE (30 mil	/30V)	
74008.XXXX	14-7 AWG STR COPPER PE30	124 lbs	0.0726″	0.133"	0.030"	17.0	500', 1000', 2500', 5000'
74010.XXXX	12-7 AWG STR COPPER PE30	197 lbs	0.0915"	0.152"	0.030"	25.0	500', 1000', 2500', 5000'
74012.XXXX	10-7 AWG STR COPPER PE30	313 lbs	0.1155″	0.176″	0.030"	39.0	500', 1000', 2500', 5000'
74014.XXXX	8-7 AWG STR COPPER PE30	479 lbs	0.1458"	0.206″	0.030"	64.0	500', 1000', 2500', 5000'

(.XXXX) INSULATION COLOR AND REEL SIZE									
PART# (.XXXX)	BLACK	BLUE	BROWN	GREEN	ORANGE	PURPLE	RED	WHITE	YELLOW
500' REEL	0132	0232	0332	0532	0632	0832	0932	1132	1232
1000' REEL	0141	0241	0341	0541	0641	0841	0941	1141	1241
2500' REEL	0147	0247	0347	0547	0647	0847	0947	1147	1247
5000' REEL	0153	0253	0353	0553	0653	0853	0953	1153	1453
*Custom lengt	hs are ava	ilalbe upo	n request	**Some	e sizes, co	lors, and le	engths ma	y be subje	t to mins

(APWA) UNIFORM COLOR CODE
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# PAGE 7



# Service Saddle

Double Stainless Steel Strap

#### CONSOLIDATED PIPE & SUPPLY 1500 COUNTY HOSPITAL ROAD NASHVILLE TN, 37218

# 317



Description: Double strap Ductile Iron service saddle with TaperSeal<sup>™</sup> gasket and wraparound 304 Stainless Steel strap for added corrosion resistance

Application: For outlets of 5%" through 4".

#### Key Features:

- Meets applicable AWWA C800 Standards
- The wide saddle body provides stability on the pipe
- Designed with PVC and other soft or brittle pipe in mind
- The gasket fully bonds to the cavity to hold it in place
- NPT, CC and other threaded outlets available in sizes 5/4" thru 4"
- Wide bands spread the load over larger area to prevent damage to the pipe when tightening the straps
- A closed lug on one side, combined with the strap, acts as a hinge for easier installation

#### Materials Specifications (subject to change):

BODIES: Ductile Iron per ASTM A536 STRAPS: Type 304 Stainless Steel. Double Strap 1.50" wide NUTS: Type 304 Stainless Steel fluoropolymer coated WASHERS: Type 304 Stainless Steel STUDS: Type 304 Stainless Steel GASKET: Nitrile (Buna N) NSF 61® compounded to resist oil, acids, alkalies, most (aliphatic) hydrocarbon fluids, water and other chemicals Temperature Range: -20°F to 180°F FINISH: Flexi-Coat® Fusion-Bonded Epoxy Finish per AWWA C213

Working Pressure: Up to 300 PSI, depending on size and application

Pipe Applications: Steel, Ductile Iron, Cast Iron, Asbestos Cement, PVC and HDPE (with spring washers)

Taps: 5%", 34", 1", 11/4", 11/2" and 2" CC Taps; 34", 1", 11/4", 11/2", 2", 21/2", 3" and 4" NPT Taps

Sizes (in inches): Varies by tap type; see tables for size details

#### CONSOLIDATED PIPE & SUPPLY 1500 COUNTY HOSPITAL ROAD NASHVILLE TN, 37218

#### 11/4", 11/2", 2" and 21/2" NPT Taps

	PA	G	Е	8
Service Sa	addles	317	7	

\*Sized for use on C900 PVC Pipe

	STANDARD			CATALOG NUMBER					METRIC	
NOM. SIZES INCHES	O.D. RANGE INCHES	WT. EACH LBS.	1-1/4" NPT/32 MM	1-1/2" NPT/40 MM	2" NPT/50 MM	2-1/2" NPT/65 MM	CTN. QTY	NOM. SIZE MM	O.D. RANGE MM	WT. EACH KG.
2 3	2.35-2.56 2.97-3.54	3 5	317-00025610-000 317-00035410-000	317-00025612-000 317-00035412-000	_ 317-00035414-000		6 6	50 80	60-65 76-89	1 2
3-4 4 4* 4-5 4-5 6	3.74-4.13 4.40-4.50 4.40-4.80 4.74-5.14 5.00-5.63 6.94-6.70	8 6 6 9 9	317-00041310-000 317-00045010-000 317-00048010-000 317-00051410-000 317-00056310-000 317-00066310-000	317-00041312-000 317-00045012-000 317-00048012-000 317-00051412-000 317-00056312-000 317-00066312-000	317-00041314-000 317-00045014-000 <b>317-00048014-000</b> 317-00051414-000 317-00056314-000 317-00066314-000	317-00041316-000 317-00045016-000 317-00048016-000 317-00051416-000 317-00056316-000 317-00066316-000	6 6 6 4 4	80-100 100 100 100 100-125 150	95-105 112-114 112-122 120-130 121-143 151-170	3 3 3 4 4
6* 6 6-8 <mark>6-8*</mark> 8-10	5.94-6.90 6.84-7.60 7.69-8.72 <mark>7.69-9.05</mark> 8.54-10.10	9 7 11 11 9	317-00069010-000 317-00076010-000 317-00087210-000 317-00090510-000 317-00101010-000	317-00069012-000 317-00076012-000 317-00087212-000 317-00090512-000 317-00101012-000	317-00069014-000 317-00076014-000 317-00087214-000 <b>317-00090514-000</b> 317-00101014-000	317-00069016-000 317-00076016-000 317-00087216-000 317-00090516-000 317-00101016-000	4 4 4 4 4	150 150 150-200 150-200 200-250	151-175 174-193 195-221 195-230 217-256	4 3 5 5 4
10* 10-12 12* 12-14	10.75-11.10 10.64-12.12 12.75-13.20 12.62-14.32	9 11 9 14	317-00111010-000 317-00121210-000 317-00132010-000 317-00143210-000	317-00111012-000 317-00121212-000 317-00132012-000 317-00143212-000	317-00111014-000 317-00121214-000 317-00132014-000 317-00143214-000	317-00111016-000 317-00121216-000 317-00132016-000 317-00143216-000	4 4 4 4	250 250-300 300 300-350	273-282 271-307 324-335 321-363	5 5 6 6
12-14 14-16 16 16-18 18* 20* 24*	14.73-15.65 15.95-17.25 17.25-17.80 17.40-18.88 19.38-19.68 21.55-21.65 25.75-25.85	18 19 19 19 19 19 30	317-00156510-000 317-00172510-000 317-00178010-000 317-00188810-000 317-00195010-000 317-00216010-000 317-00258010-000	317-00156512-000 317-00172512-000 317-00178012-000 317-0018812-000 317-00195012-000 317-00216012-000 317-00258012-000	317-00156514-000 317-00172514-000 317-00178014-000 317-00188814-000 317-00195014-000 317-00216014-000 317-00258014-000	317-00156516-000 317-00172516-000 317-00178016-000 317-00188816-000 317-00195016-000 317-00216016-000 317-00258016-000	1 1 1 1 1 1	300-350 350-400 410 400-450 450 500 600	375-397 406-438 438-452 442-479 492-500 547-500 654-657	8 9 9 9 9 14

When properly sized from the factory, this product (denoted by \*) meets the requirements listed in the Uni-Bell PVC Pipe Association's "Handbook of PVC Pipe" and in the AWWA's "Manual M23: PVC Pipe Design and Installation."

#### 3" and 4" NPT Taps

\*Sized for use on C900 PVC Pipe

S	TANDARD		CATALOG	NUMBER				
NOM. SIZES INCHES	O.D. RANGE INCHES	WT. EACH LBS.	3" NPT/80 MM	4" NPT/100 MM	CTN. QTY	NOM. SIZE MM	O.D. RANGE MM	WT. EACH KG.
6 8-10	6.84-7.60 8.54-10.10	13 15	317-00076017-000 317-00101017-000	317-00076018-000 317-00101018-000	2 3	150 200-250	174-193 217-256	6 7
10* 10-12 12* 12-14	10.75-11.10 11.30-12.12 12.75-13.20 13.40-14.32	14 14 18 18	- 317-00121017-000 - 317-00143017-000	- 317-00121018-000 - 317-00143018-000	- 2 - 2	250-300 - 300-350	271-307 321-363	- 6 - 8

When properly sized from the factory, this product (denoted by \*) meets the requirements listed in the Uni-Bell PVC Pipe Association's "Handbook of PVC Pipe" and in the AWWA's "Manual M23: PVC Pipe Design and Installation."



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# **RED BRASS PIPE NIPPLES**



CONSOLIDATED PIPE & SUPPLY CO. INC. 1500 COUNTY HOSPITAL RD NASHVILLE TN 37218

Materials: ASTM B43 Sch. 40 Seamless, Red Brass Pipe Dimensions: ASTM B687 Threads: ASME B1.20.1 NPT



Pipe Size	Outside Diameter	Length Close	Wall Thickness	Thickness Tolerance		Red Brass Pipe Nipples Sch. 40								
Inches	Inches	Inches	Inches(mm)	Inches(mm)					Nipples	Length				
1/8"	0.405	3/4	0.062(1.57)	0.004(0.10)	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
1/4"	0.540	7/8	0.082(2.08)	0.005 (0.13)	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
3/8"	0.675	1	0.090(2.29)	0.005 (0.13)	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
1/2"	0.840	1 1/8	0.107(2.72)	0.006(0.15)	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
3/4"	1.050	1 3/8	0.114(2.90)	0.006(0.15)	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
1"	1.315	1 1/2	0.126(3.20)	0.007(0.18)	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
1 1/4"	1.660	1 5/8	0.146(3.71)	0.008(0.20)	-	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
1 1/2"	1.900	1 3/4	0.150(3.81)	0.008(0.20)	-	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
2"	2.375	2	0.156(3.96)	0.009(0.23)	-	-	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
2 1/2"	2.875	2 1/2	0.187 (4.75)	0.010 (0.25)	-	-	-	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
3"	3.500	2 5/8	0.219 (5.56)	0.012 (0.30)	-	-	-	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
4"	4.500	2 7/8	0.250(6.35)	0.013(0.33)	-	-	-	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"





Materials: ASTM B584 C87800 Dimensions: Fittings ASME B16.15 Flanges ASME B16.24 MSS SP-106 Unions A-A-59617 Threads: ASME B1.20.1 Complies with: NSF/ANSI STANDARD 61 - ANNEX G (AB1953) NSF/ANSI STANDARD 372 ISO9001, CRN

CONSOLIDATED PIPE & SUPPLY 1500 COUNTY HOSPITAL ROAD NASHVILLE TN, 37218





٦	EES	
Size	A	Kg
1/8	14.1	0.036
1/4	19.0	0.056
3/8	22.1	0.093
1/2	26.3	0.136
3/4	30.4	0.219
1	36.5	0.336
1 1/4	44.3	0.532
1 1/2	46.0	0.605
2	55.5	0.968
2 1/2	70.0	2.042
3	75.0	2.269
4	98.0	5.445





BRAN	BRANCH REDUCING TEES							
Size	Α	В	Kg					
1/2 x 1/4	22.4	23.0	0.107					
3/4 x 1/4	30.8	32.5	0.204					
3/4 x 1/2	28.0	30.3	0.186					
1 x 1/4	37.2	35.5	0.233					
1 x 1/2	31.8	27.6	0.266					
1 x 3/4	33.3	34.4	0.279					
1 1/4 x 1/2	33.3	37.2	0.353					
1 1/4 x 3/4	37.0	39.0	0.397					
1 1/4 x 1	39.2	42.6	0.415					
1 1/2 x 1/2	35.0	32.2	0.454					
1 1/2 x 3/4	37.1	42.0	0.439					
1 1/2 x 1	40.0	44.0	0.560					
<u>1 1/2 x</u> 1 1/4	43.9	46.9	0.593					
<mark>2 x 1/2</mark>	37.1	47.0	0.635					
2 x 3/4	40.0	47.9	0.681					
2 x 1	42.6	49.0	0.766					
2 x 1 1/4	47.0	52.7	0.822					
2 x 1 1/2	58.7	54.0	0.936					
2 1/2 x 1 1/2	55.0	61.4	1.475					
2 1/2 x 2	60.2	64.4	1.815					
3 x 1 1/2	58.0	71.1	1.758					
3 x 2	62.2	71.2	1.891					
3 x 2 1/2	72.2	74.5	2.495					
1/2 x 1/2 x 3/4	28.3	27.5	0.159					
3/4 x 3/4 x 1	34.0	32.8	0.260					

Dimensions in mm

# 10.58



CONSOLIDATED PIPE & SUPPLY CO. INC. 1500 COUNTY HOSPITAL RD NASHVILLE TN 37218

# 2"-3" A-2362 RESILIENT WEAGE = 11

Rev. 7-19

- Catalog number
   A-2362-8 threaded ends
- □ Sizes 2", 2-1/2", 3"
- Meets or exceeds all applicable requirements of ANSI/AWWA C509 Standard, UL 262 Listed, FM 1120/1130Approved, and certified to ANSI/NSF 61 & 372
- Threaded end dimensions comply with ANSI B2.1
- □ Iron body with nominal 10 mils Mueller Pro-Gard<sup>™</sup> Fusion Bonded Epoxy Coated interior and exterior surfaces
- Epoxy coating meets or exceeds all applicable requirements of ANSI/AWWA C550 Standard
- Iron wedge, symmetrical and fully encapsulated with molded rubber; no exposed iron
- Non-rising stem (NRS)
- Triple O-ring seal (2 above the thrust collar and 1 below)
- 2" square wrench nut open left or open right
- 350 psig (2400 kPa/24 barg) maximum working pressure; 700 psig (4000 kPa/48 barg) static test pressure
- 2-1/2"-3" size UL Listed, FM Approved: 350 psig (2400 kPa/24 barg)
- Designed for potable water applications



A-2362-8 shown

#### Options

#### See page 10.54 for more information on Resilient Wedge Gate Valve options

Position indicators

- □ Low zinc, silicon bronze ASTM B98-C66100/H02 stem
- Handwheel
- $\hfill\square$  EPDM DISC and O-rings

#### Resilient wedge gate valve parts

Catalog Part Number	Description	Material	Material Standard
G-16	Bonnet bolts and nuts	Stainless steel	Туре 316
G-41	Stuffing box bolts and nuts	Stainless steel	Туре 316
G-49	Stem O-rings (3)	Nitrile	ASTM D2000
G-200	Wrench nut cap screw	Stainless steel	Туре 316
G-201	Stuffing box with dirt seal*	Ductile iron Nitrile	ASTM A536 ▼ ASTM D2000
G-202	Wrench nut	Ductile iron	ASTM A536 ▼
G-203	Stem	Bronze	ASTM B138
G-204	Handwheel (not shown)	Cast iron	ASTM A126 CL.B
G-205	Stem nut	Bronze	ASTM B584
G-206	Guide cap bearings	Acetal	-
G-207	Stuffing box	Ductile iron	ASTM A536 ▼
G-208	Anti-friction washers (2)	Acetal	-
G-209	Wedge Rubber Encapsulation	Ductile iron SBR	ASTM A536 ▼ -
G-210	Bonnet	Ductile iron	ASTM A536 ▼
G-211	Bonnet gasket	Nitrile	ASTM D2000
G-212	Body	Ductile iron	ASTM A536 🔻

\* Fully encapsulated in molded rubber with no iron exposed
 ▼ Material strength ASTM A536 65-45 minimum
 \*Dirt seal on 2 1/2 -3" valves



Mueller Co.)

Rev. 2-17

#### CONSOLIDATED PIPE & SUPPLY CO. INC. 1500 COUNTY HOSPITAL RD NASHVILLE TN 37218



#### Dimensions

Dimension*	Nominal Size						
	2"	3"					
A	9.88	12.38	12.38				
FF	5.88	5.88	6.88				
Q (bore)	2.30	2.80	3.30				
H (hex across flats)	3.88	4.25	5.00				
DD	4.12	4.12	5.12				
Turns to open	8	11	11				
Weight*	31	60	62				

\*All dimensions are in inches. All weights are in pounds and are approximate.





## 

# PAGE 14

# 24" Precast

# **Round Valve Pad**



CONSOLIDATED PIPE & SUPPLY CO. INC. 1500 COUNTY HOSPITAL RD NASHVILLE TN 37218

#3 Rebar Used

Note: 4500 PSI

Weight:

Concrete

111 lbs.

HULA CONRETE PRODUCTS, INC.

Hickman, TN 38567

#### SERVICE FITTINGS WITH MUELLER 110<sup>®</sup> **COMPRESSION CONNECTION**



5/8" x 3/4"

1" x 1-1/4"

2"

1"

3/4"

1"

1-1/4"

2" x 1-1/2"

Shaded area indicates change Rev. 10-14



H-15403N

Straight three part union Mueller 110<sup>®</sup> Conductive **Compression Connection for** CTS O.D.\* tubing-both ends



H-15451N

1/2" x 3/4"

1" x 3/4"

1/2" 1"

3/4"

1-1/2" x 1"

Straight coupling Mueller 110 Conductive Compression Connection for CTS O.D.\* tubing x F.I.P. thread

3/4" x 1/2"

1-1/4"

x 1"

3/4" x 1"

1-1/2"

1/2"	1/2"x3/4"	5/8"x3/4"	5/8" 3/4"		1"	
1"x3/4"	1-1/4"	1-1/4"x1"	1-1/2"		1-1/2"x1"	2"



Straight coupling Mueller 110 Conductive Compression Connection for CTS O.D.\* tubing x M.I.P. thread

Straight three part union Mueller 110<sup>®</sup> Compression

Connection for IPS PE\*

pipe-both ends

H-15428N

1/2"‡	1/2" x 3/4"	5/8" x 3/4"	3/4"	3/4" x 1/2"	3/4" x 1"
1"	1" x 3/4"	1-1/4"	1-1/4" x	1"	1-1/2"
1-1/2" x 1"		1-1/2" x 2"	1" x 2"	<mark>2"</mark>	2" x 1-1/2"



H-15409N

H-15429N

Straight coupling Mueller 110 Compression Connection for IPS PE\* pipe x M.I.P. thread

1"x3/4"

Straight coupling three part union Mueller 110 Conductive **Compression Connection** for CTS O.D.\* tubing x 110 **Compression Connection for** 

H	-1	54	<b>U4</b> I	N	

1"

						IFSFE pipe		
3/4"	1"	1"x	3/4"	3/4"	3/4"x1"	1"	1"x3/4"	
Straight coup Mueller 110 C Compression CTS O.D. tub Connection for		Straight coupl Mueller 110 Co Compression C CTS O.D. tubin Connection for	<b>ing</b> onductive Connection for Ig x Pack Joint IPS PE pipe			<b>Straight coupling</b> Mueller 110 Compression Connection for IPS PE* pipe x F.I.P. thread		
E-15409N **Note: 3/4" size only may also be used on PVC		may also be used	H-15454N					
3/4"**	3/4"x1"	1"	1"x3/4"	3/4"	1"		1"x3/4"	
		<b>Straight Female coupling</b> Mueller Coupling Thread Swivel x 110 CTS Conductive Compression Connection for		(		Straight co Mueller 110 Compressio CTS O.D. tu flare put	Conductive on Connection for ubing x copper	
H-15413N		013 U.D.		H-	15079N	no. o not		

\*See chart on page 6.11 for tubing and pipe that may be used with these connections.

‡Requires minimum ordering quantity. Contact MUELLER Customer Service Center for minimum ordering requirements and availability.

NOTE: Sizes shown above represent nominal size of fitting. When two sizes are given, first is size of MUELLER 110 Compression Connection and second is size of threaded end.

3/4"



# PAGE 17



E PAGE 18 5592AB Lead Free Brass Full Port Ball Valve

#### Feature

150# WSP / 600# WOG Lead free brass body Full port Adjustable packing FNPT x FNPT Threaded ends (ASME B1.20.1-NPT) Blow-out proof stem Virgin PTFE seats MSS-SP-110 CSA  $\frac{1}{2}$ , 5 & 125 psi ( $\frac{1}{4}$ " - 2") CSA  $\frac{1}{2}$  psi ( $\frac{2}{2}$ " & 3") CSA  $\Delta$ C ( $\frac{1}{4}$ " - 2") UL approved ( $\frac{1}{4}$ " - 2") AB1953, NSF/ANSI 61 & 372 certified



 Pressure/ Temperature rating

 600 psi from 15 °F to 160 °F
 150 psi max. at 366 °F

#### Material

	Part	Material	Specification	
1	Body	Lead Free Brass	ASTM B927 C27450	
2	End piece	Lead Free Brass	ASTM B927 C27450	
3	Ball	Lead Free Brass / Cr plated	ASTM B927 C27450	
4	Seat	PTFE	PTFE	
5	Stem	Lead Free Brass	ASTM B927 C27450	
6	O-ring	FKM	NSF approved	
7	Packing nut	PTFE	PTFE	
8	Packing nut	Brass	ASTM B124 C37700	
9	Handle	Steel / Dacromet <sup>®</sup> plated	A36	
10	Handle nut	Steel / Zn plated	A36	



#### CONSOLIDATED PIPE & SUPPLY CO. INC. 1500 COUNTY HOSPITAL RD NASHVILLE TN 37218







#### Dimension, Cv, Weight

redwhitevalvecorp.com

	Φ	A	C	H	L	P	Cv	Wt.
		[in]	[in]	[in]	linj	[in]		נמון
1⁄4"	1⁄4 - 18 NPT	1.77	0.45	1.54	3.19	0.39	8	0.26
3/8"	3∕8 - 18 NPT	1.77	0.45	1.54	3.19	0.39	8	0.28
1/2"	½ - 14 NPT	2.17	0.61	1.93	3.58	0.50	11	0.40
3⁄4"	¾ - 14 NPT	2.40	0.63	2.05	3.58	0.73	26	0.56
1"	1 - 11.5 NPT	2.91	0.75	2.36	4.96	0.95	55	0.98
1¼"	1¼ - 11.5 NPT	3.31	0.77	2.60	4.96	1.22	103	1.34
<b>1½</b> "	1½ - 11.5 NPT	3.54	0.77	2.87	5.55	1.46	111	1.88
2"	2 - 11.5 NPT	4.09	0.79	3.25	5.55	1.95	353	2.96
<b>2</b> <sup>1</sup> / <sub>2</sub> "	<b>2</b> ½ - 8 NPT	5.31	1.06	4.17	7.91	2.44	409	6.08
3"	3 - 8 NPT	6.02	1.14	4.53	11.06	2.91	530	8.94
4"	4 - 8 NPT	6.89	1.20	5.00	11.06	3.54	972	12.82



WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Drawings, photos and data are provided for information only and subject to change without notice. No part of this document may be reproduced, copied, modified or adapted, without the prior written consent of the copyright owner, unless otherwise indicated. The Drinking Vlater Act has defined leaf rese as having the average vetted surface ratio of the future to contain less than .25% of lead per volume.

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pg1/1 [190920]
# Be Confident with Sustained Accuracy Over Time

# Neptune<sup>®</sup> MACH 10<sup>®</sup> Ultrasonic Meter



The MACH 10<sup>®</sup> ultrasonic water meter features solid state metrology with no degradation of accuracy over time. Combined with a corrosion-resistant, lead free, high-copper alloy maincase, the MACH 10 is built to withstand demanding service conditions and deliver sustained accuracy over the life of the meter.

- Sizes 1½ " and 2"
- Extended low-flow range for superior leak detection
- Accuracy sustained over meter life
- Can be installed in both horizontal and vertical applications
- Advanced ultrasonic technology
- Lead free, high-copper alloy maincase
- Certified to UL 327B (1½", 2") for residential fire service applications
- No maintenance



## **Specifications**

AWWA C715 Compliant

NSF/ANSI 61 Certified

UL 327B Certified (Optional for 1½", 2")

#### Application

• Cold water measurement of flow in potable, combination potable and fire service, and reclaim/secondary water applications.

#### **Maximum Operating Water Pressure**

• 175 psi

#### **Operating Water Temperature Range**

• +33°F to +122°F (+0.5°C to +50°C)

#### **Environmental Conditions**

- Operating temperature: +14°F to +149°F (-10°C to +65°C)
- Storage temperature: -40°F to +158°F (-40°C to +70°C)

#### **Expected Battery Life**

• 20 years

## **Options**

#### Sizes

- 1½"
- 2"

#### **Meter Options**

- Potable water
- Reclaim water
- Residential fire service (combo or standalone meter service lines)

## Warranty

 Neptune provides a limited warranty for performance, materials, and workmanship. See warranty statement for details.

## System Compatibility

 Compatible with all Neptune endpoints. Also available as MACH 10<sup>®</sup>)R900i<sup>™</sup> for an integrated radio solution and MACH 10<sup>®</sup>)TC for Sensus Touch Coupler compatibility.

# **Operating Characteristics**

<mark>Meter</mark> Size	Normal Operating Range @ 100% Accuracy (+/- 1.5%)	AWWA C715 Standard Type 1	Extended Low Flow @ 100% Accuracy (+/- 3.0%)
11⁄2″	0.80 to 125 U.S. gpm	2.0 to 100 U.S. gpm	0.30 U.S. gpm
2″	1.50 to 160 U.S. gpm	2.5 to 160 U.S. gpm	0.50 U.S. gpm

## **Dimensions**

Meter Size	Length	Height	Flanges
	10"	6¼"	Oval
11///	13″	6¼"	Oval
1 72	12%″	6¼"	Internal Thread
	12%″	6¼"	External Thread
	10"	6½"	Oval
	15¼″	6½"	Oval
2″	17"	6½"	Oval
	15¼″	6½"	Internal Thread
	15¼″	6½"	External Thread

## Available Units of Measure

Consumption	Rate
Gallons	GPM
Cubic Feet	GPM
Cubic Metres	LPM
Cubic Meters (International)	LPM
Imperial Gallons	GPM
Acre-Feet*	GPM
Litres*	LPM
Kilolitres*	LPM

\*Unit cannot be displayed on LCD

## LCD Display

9-digit display for extra resolution on manual reads.



## Registration

High (8-dig	Resolution it reading)	1½″	2″
1	U.S. Gallons	$\checkmark$	$\checkmark$
1	Imperial Gallons	$\checkmark$	$\checkmark$
0.1	Cubic Feet	$\checkmark$	$\checkmark$
0.01	Cubic Metres	$\checkmark$	$\checkmark$

## **Pressure Loss**

Typical meter performance. Individual results may vary.





Neptune Technology Group 1600 Alabama Highway 229 Tallassee, AL 36078 800-633-8754 f 334-283-7293

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# Critical Communication and Easy Migration

Neptune<sup>®</sup> R900<sup>®</sup> System Endpoints



Neptune's R900<sup>®</sup> System endpoints greatly improve access to meter readings while delivering accurate, detailed, and timely consumption information to proactively identify and resolve high bill complaints, reduce delinquent payments, and eliminate write-offs to maximize revenue. The user-friendly, intuitive endpoint design simplifies the installation process and increases operational efficiency.

Neptune R900 wall and pit endpoints provide continuous transmission of meter data and the flexibility of mobile or fixed network reading methods. Migrate easily to AMI when you're ready without separate reading systems, site visits, or endpoint reconfiguration.

- Improve meter reading efficiency with robust walk-by, mobile, and fixed network connectivity
- Build on to existing technology investments with forward and backward compatible endpoints
- Improve quality of service and billing accuracy with detailed consumption data

- Fast installation and no programming required
- Works seamlessly with existing assets and future enhancements
- Pinpoint trouble areas quickly with flags that identify leaks, reverse flow, and tampering
- Peace of mind with access to 96 days of stored history



## **Technical Specifications**

#### **Electrical Specifications**

• Endpoint power: Lithium battery with capacitor

#### Transmitter Specifications

- Two-way endpoint
- Transmit period (interleaved mobile and fixed network messages):
- Standard mobile message every 14 seconds at 100 mW
- Standard fixed network message every 7½ minutes at 1 Watt
- FCC verification: Part 15.247
- Transmitter channels: 50; frequency-hopping, spread-spectrum
- Frequency range: 910 to 920 MHz
- Encoder register reading interval:
- ° Every 15 minutes
- Data logging interval:
  - ° 96 days of hourly data

#### **Environmental Conditions**

- Operating temperature: -22°F to +149°F (-30°C to +65°C)
- Storage temperature: -40°F to +158°F (-40°C to +70°C)
- Operating humidity: 100% condensing

#### <mark>Antenna</mark>s

- Wall endpoint: standard internal antenna
- Pit endpoint: standard throughthe-lid antenna
- ∘ 18" Coax
- ∘ 6' Coax
- <mark>20' Coax</mark>

#### **Encoded Register Compatibility**

- Neptune ARB<sup>®</sup> V, ProRead<sup>™</sup>, ProCoder<sup>™</sup>, and E-CODER<sup>®</sup>
- Sensus ECR II, ICE, iPerl, Electronic Register and OMNI
- Hersey/Mueller Translator
- Badger ADE and HR E|LCD
- Elster/AMCO InVision (Sensus protocol version)

#### **Options**

#### System Compatibility

- Handhelds with R900<sup>®</sup> belt clip transceiver - mobile RF
- R900 mobile data collector mobile RF
- R900 gateways fixed network RF

#### Warranty

• Neptune provides a limited warranty for performance, materials, and workmanship. See warranty statement for details.

#### Dimensions





#### R900 Wall Endpoint

)@/



R900 Pit Endpoint



R900 Pit Antenna



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#### **#winyourday** neptunetg.com

#### Neptune Technology Group

1600 Alabama Highway 229 Tallassee, AL 36078 800-633-8754 f 334-283-7293



## Source for Neptune<sup>(1)</sup> MACH-10, ProCoder, and E-CODER Water Meters!

SCADAmetrics<sup>®</sup> is pleased to introduce the newest member of its DINstrumentation<sup>™</sup> series – **The Signalizer<sup>™</sup>!** 

This new electronic signal generator for water meters provides a 4-20 milliamp (flow) output and a dry contact pulse (per volume) output! – while still maintaining the meter's ability to be co-connected to an AMI/AMR endpoint!

Meter Owners have traditionally been required to make a weighted buying decision: encoder-type meter?... or milliamp/pulse-type meter? **The Signalizer** allows you to easily have <u>both</u> with the same meter!

**The Signalizer** utilizes the popular encoder signal from the water meter to generate both a 4-20mA rate-of-flow signal<sup>1</sup> and a dry-contact pulse-per-volume signal. ...And because **The Signalizer** is outfitted with an integral pass-thru port, it can co-exist with an AMI/AMR system<sup>(2)</sup>. Even if power is removed, the pass-thru port is always functional – ensuring continuous connectivity to the AMR/AMI system!

**The Signalizer** is compatible with the Neptune PROCODER, E-CODER, and MACH- $10^{(3)}$  registers.

<sup>(1)</sup>Encoder Resolution – a high-fidelity 4-20mA signal requires high-resolution encoder resolution (8+ digits). Therefore, for optimal SIGNALIZER performance, we recommend the MACH-10, PROCODER or E-CODER register. When the SIGNALIZER is utilized with a ProRead register, it will only produce a pulse output signal. The SIGNALIZER is NOT compatible with the R900i (integrated radio) versions of these registers.

<sup>(2)</sup>**Permitting** – If the meter is owned by the water utility, we recommend that you first contact its engineering department for permission!

(3)MACH-10 Reaction Time – In order to preserve the battery life of the MACH-10, the sample period of the Signalizer should be set to 300+ seconds, resulting in a signal reaction delay of up to 300s for both the 4-20mA and pulse signals. If a more "realtime" signal is required, then a mechanical meter with PROCODER or E-CODER register should be used.

#### Key Features -

• 4-20mA Flow-Proportional Output (3KV Isolation).

METER

- Dry-Contact, Volume-Proportional Output (3.75KV Isolation).
- Dry-Contact Alarm Output (3.75KV Isolation).
- Built-In Pass-Thru Port for Co-Connection to an AMI/AMR System Works Even If Power Down!
- Compatible with MACH-10, PROCODER, and E-CODER registers.
- Works with All Popular Registration Units (Gallons, Cubic Feet, Cubic Meters, Acre Feet).
- No Computer Required! Setup via DIP Switches Only!
- Removable Terminal Blocks, Simplified Wiring Procedures.
- Mounts on standard 35mm industrial DIN-rail.
- 24VDC-Powered (1.5KV Isolation). Low 1.2W Power Consumption.
- Enclosure and Circuit Board: UL 94-VO recognized materials.
- Simulation-Mode Feature: Emits 12mA and 1 Hz Pulse.

Are you interested in how SCADAmetrics meter technology can help you more closely monitor the flow through your water meters? Give us a call! We'll be glad to discuss the details!

> SCADAmetrics scadametrics.com Wildwood, Missouri USA 636.405.7101



# **Engineering Specifications -**

4.5" x 5.0" x 1.275" 6.5 Ounces 9-36V <sub>DC</sub> 1.25W 1500V <sub>RMS</sub>
Yes, 8,9-Digit "MACH-10/ProCoder/E-CODER", and 6-Digit "ProRead" Protocols Yes, Both Fixed and Variable Digit Sensus Protocols (4-9 digits) Yes, Auto-Fills Units and Decimal Shift, Based on Embedded Info within Elster K-Frame Universal – Works with All Major-Brand AMI/AMR Endpoints: Neptune, Sensus, Aclara, Badger, Metron-Farnier, Itron, Master Meter, Hersey/Mueller, RG3, Zenner, Honeywell, Kamstrup, SCADAmetrics, Touchpads (All), Remote Displays (All)
Gallon, Cubic Feet, Cubic Meters, Acre-Feet x1 , x10 , x100 , x1,000 x0.1 , x0.01 , x0.001 , x0.0001 , x0.00001 5, 10, 15, 30, 60, 300, 600, 900 (User-Selectable) Integrated DIP Switches, 16-Poles
$\begin{array}{l} 20,30,50,80,125,200,300,500,750,1200,2000,3000,4600,7300,11400,18000\\ 75,120,200,300,475,750,1200,2000,3000,4500,7000,11000,17500,27500,43000,68000\\ 16-Bit DAC\\ 3000V_{\text{RMS}}\\ 500\ \Omega\\ \text{Active. Therefore, } \underline{do\ not} \ \text{add} \ \text{an external loop supply, or else damage to the unit will result!} \end{array}$
Solid-State Dry-Contact, 1 Pulse-per-Encoder Resolution 50% Duty Cycle or 1000ms – whichever is less Solid-State Dry-Contact, Closes if Meter or Signalizer Fault Normal-Speed Mode: Pulse Resolution = Encoder Resolution Low-Speed Mode: Pulse Resolution = Encoder Resolution / 10 0.4 ohm, typical 500mA 60V 3750V <sub>RMS</sub>
3-Position, Removable Screw-Down Terminal Block, 12-26 AWG 3-Position, Removable Screw-Down Terminal Block, 12-26 AWG Yes, Supports both 3-Wire and 2-Wire AMR Devices
-40C to 85C (-40°F to 185°F) 5% to 95%, Non-Condensing Built to IP40 Specifications, Not Rated for Submersion/Outdoor Use USA ROHS-Compliant, Lead-Free AWWA C707-05 2 Years (see www.scadametrics.com for details)

## **Engineering Dimensions (Inches) -**



## Meter Terminal Block Hookup -

Term.	Function	Neptune Meter With Standard Cable	Neptune Meter with Nicor Cable	Neptune Meter with Itron ERT Cable
1	Meter Clock	Black	Red	Black
2	Meter Data	Red	Green White	Red
3	Meter Ground	Green	Black	White Shield

## AMR/AMI Terminal Block Hookup -

Term.	Function	Neptune MIU with Standard Cable	Neptune (or other) MIU with Nicor Cable	Neptune (or other) MIU with Itron ERT Cable	Sensus, Badger, Mueller, Master-Meter, Metron-Farnier, Zenner, RG3, Kamstrup MIU	Elster AMCO MIU
4	AMI Clock	Black	Red	Black	Red	White Green
5	AMI Data	Red	Green White	Red	Green White	Red
6	AMI Ground	Green	Black	White Shield	Black	Black

Wiring Notes:

- 1. <u>Meter</u> Terminal Block Hookup (Terminals 1,2,3): Apply the color-coding that pertains to the manufacturer of the Water Meter (or manufacturer of the Specialty Cable, such as Nicor or Itron).
- 2. <u>Utility AMI/AMR</u> Terminal Block Hookup (Terminals 4,5,6): Apply the color-coding that pertains to the manufacturer of the AMI/AMR Endpoint (or manufacturer of the Specialty Cable, such as Nicor or Itron).

## Signal Terminal Block Hookup -

Terminal	Function	Notes
7	4-20mA +	Sattable Dange via DID Switches
8	4-20mA –	Settable Range via DIP Switches
9	Pulse +	Solid-State Dry Contact (N-O)
10	Pulse –	500mA Max, 60V Max
11	Alarm +	Solid-State Dry Contact (N-O)
12	Alarm –	500mA Max, 60V Max

## DIP Switch Setup (Also Imprinted on Device Rear Cover) -



# **QUICK-START GUIDE -**



## WIRING FOR:

NEPTUNE MACH-10, PROCODER, E-CODER, & WATERFLUX 3070 Fig1

## **Initial Setup:**

- **1.** Attach the water meter's three (3) encoder wires to Signalizer terminals 1,2,3 (see above table for color-coding).
- 2. (If Applicable) Attach the AMR/AMI endpoint's three (3) encoder wires to Signalizer terminals 4,5,6 (see above table for color-coding).
- 3. (If Applicable) Connect the 4-20mA output signal to PLC/Controller: Terminals 7(+) and 8(-). Important Note! – The Signalizer<sup>™</sup> provides loop power. The user <u>must not</u> add an additional loop power supply, or else damage to the unit will result.
- 4. (If Applicable) Connect the pulse output signal to the PLC/Controller: Terminals 9 and 10. Important Note! – The pulse output is a solidstate, dry-contact type. 500mA max, 60V max. Circuit must be current-limited by external means.
- 5. (If Applicable) Connect the alarm output signal to the PLC/Controller: Important Note! The alarm output is a solid-state, dry-contact type. 500mA max, 60V max. Circuit must be current-limited by external means.
- 6. Set the DIP Switches, per the Datasheet.
- 7. Connect DC voltage source to the Signalizer's V+/V- terminals. An isolated  $24V_{DC}$  power supply is recommended.

#### Apply Power, and Observe...

- The Upper Yellow 'Hearbeat' LED should light up YELLOW, with an OCCASIONAL BLINK, signifying that the Signalizer is working.
- The Upper Green 'Meter OK' LED should light up SOLID GREEN, signifying that the meter has been successfully detected.
- The Lower Yellow LED will follow the Pulse Output (LED ON=Contact Closure).
- $_{\odot}$  The Lower Green LED will light up SOLID GREEN during periods when Positive Flow is Detected.

# **NEPTUNE WATER METERS** – PERSONALITY SETTINGS FOR NEPTUNE WATER METERS.

**PAGE 29** 

## Recommended DIP Switches 1-12, Settings for MACH-10:

Size	Gallon	Cubic Feet	Cubic Meters	
5/8", 3/4", 1"	DipSw.1=ON	DipSw.1=ON	DipSw.1=ON	
	DipSw.2=	DipSw.2=	DipSw.2=	
	DipSw.3=	DipSw.3=ON	DipSw.3=	
	DipSw.4=	DipSw.4=	DipSw.4=ON	
	DipSw.5=ON	DipSw.5=ON	DipSw.5=ON	
	DipSw.6=	DipSw.6=	DipSw.6=	
	DipSw.7=ON	DipSw.7=ON	DipSw.7=ON	
	DipSw.8=	DipSw.8=	DipSw.8=	
	DipSw.9=	DipSw.9=ON	DipSw.9=	
	DipSw.10=	DipSw.10=	DipSw.10=ON	
	DipSw.11=ON	DipSw.11=ON	DipSw.11=ON	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	DipSw.12=	DipSw.12=	DipSw.12=	
	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	
	1 Pulse / 0.1 Gal	1 Pulse / 0.01 FT <sup>3</sup>	1 Pulse / 0.001 M <sup>3</sup>	
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	Red and the second second
	1 Pulse / 1 Gal	1 Pulse / 0.1 FT <sup>3</sup>	1 Pulse / 0.01 M <sup>3</sup>	
1.5″, 2″, 3″, 4″	DIPSW.1=ON	DipSw.1=ON	DipSw.1=ON	6
	DipSw.2=	DipSw.2=	DipSw.2=	
	DipSw.3=	DIPSW.3=ON	DipSw.3=	<b>MACH 10</b>
	DipSw.4=	DipSw.4=	DIPSW.4=ON	
	Discus E-ON			
	DipSw.7=ON	DipSw.7=ON	DipSw.7=ON	
	olbam.o=	oibam'e=	pibam'9=	
	Discus 0-	Din Sur 0-	Dirfow 0-ON	
	DipSw.9=	DipSw.9=	DipSw.9=ON	
	DipSw 11 -	DipSw.10-	DipSw.10-	
	DipSw 12-	DipSw 12-	DipSw.11=ON	
	Dip5W.12=	Dip3W.12=	Dip5W.12-	
	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	
	1 Pulse / 1 Gal	1 Pulse / 0.1 FT <sup>3</sup>	1 Pulse / 0.01 M <sup>3</sup>	
	11 0.50 / 1 00.			
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	MACH-10 Reaction
	1 Pulse / 10 Gal	1 Pulse / 1 FT <sup>3</sup>	1 Pulse / 0.1 M <sup>3</sup>	
6"-12"	DipSw.1=ON	DipSw.1=ON	DipSw.1=ON	Time
0 12	DipSw.2=	DipSw.2=	DipSw.2=	
	DipSw.3=	DipSw.3=ON	DipSw.3=	
	DipSw.4=	DipSw.4=	DipSw.4=ON	
	-	-	-	In order to preserve the battery life
	DipSw.5=ON	DipSw.5=ON	DipSw.5=ON	of the MACH 10, the complemented
	DipSw.6=	DipSw.6=	DipSw.6=	of the MACH-10, the sample period
	DipSw.7=ON	DipSw.7=ON	DipSw.7=ON	of the Signalizer should be set to
	DipSw.8=	DipSw.8=	DipSw.8=	300+ seconds, resulting in a signal
				reaction delay of up to 300s for
	DIpSW.9=ON	DipSw.9=	DipSw.9=	
	DipSw.10=	DipSw.10=	DipSw.10=	both the 4-20mA and pulse signals.
	DipSw.11=	DipSw.11=	DIPSW.11=UN	
	DIDSW.12=	DipSw.12=	DIPSW.12=	If a more "realtime" signal is
1	Normal Speed Pulses	Normal Sneed Bulser	Normal Sneed Bulser	required then a mechanical motor
	1 Pulse / 10 Gal	1 Pulse / 1 FT <sup>3</sup>	1 Pulse / 0 1 M <sup>3</sup>	
		I FUISC / I FI	I FUISE / U.I M	with PROCODER or E-CODER
	Low Speed Pulse	Low Speed Pulse	Low Speed Pulse	register should be used.
	1 Pulse / 100 Gal	1 Pulse / 10 FT <sup>3</sup>	1 Pulse / 1 M <sup>3</sup>	
16″	DipSw.1=ON	DipSw.1=ON	DipSw.1=ON	1
	DipSw.2=	DipSw.2=	DipSw.2=	
	DipSw.3=	DipSw.3=ON	DipSw.3=	
	DipSw.4=	DipSw.4=	DipSw.4=ON	
	1 .	1 -	1	
	DipSw.5=ON	DipSw.5=ON	DipSw.5=ON	
	DipSw.6=	DipSw.6=	DipSw.6=	
	DipSw.7=ON	DipSw.7=ON	DipSw.7=ON	
	DipSw.8=	DipSw.8=	DipSw.8=	
	DipSw.9=	DipSw.9=ON	DipSw.9=	
	DipSw.10=ON	DipSw.10=	DipSw.10=	
	DipSw.11=	DipSw.11=	DipSw.11=	
	DipSw.12=	DipSw.12=	DipSw.12=	
1	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	
	1 Pulse / 100 Gal	1 Pulse / 10 FT <sup>3</sup>	1 Pulse / 1 M <sup>3</sup>	
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	
	1 Pulse / 1000 Gal	1 Pulse / 100 FT <sup>3</sup>	1 Pulse / 10 M <sup>3</sup>	

# **NEPTUNE WATER METERS –** PERSONALITY SETTINGS FOR NEPTUNE WATER METERS.

PAGE 30

## Recommended DIP Switches 1-12 for **<u>ProCoder</u>**, and **<u>E-CODER</u>** Registers:

Size	Caller	Cubic East	Cubic Motors	
Size	Gallon	Cubic Feet		
5/8", 3/4", 1"	DipSw.1=ON	DipSw.1=ON	DipSw.1=ON	
	DipSw.2=	DipSw.2=	DipSw.2=	
	DipSw.3=	DipSw.3=ON	DipSw.3=	
	DipSw.4=	DipSw.4=	DipSw.4=ON	
	DipSw.5=	DipSw.5=	DipSw.5=	
	DipSw.6=ON	DipSw.6=ON	DipSw.6=ON	
	DipSw.7=	DipSw.7=	DipSw.7=	12 1111 C
	DipSw.8=	DipSw.8=	DipSw.8=	
	-	-		
	DipSw.9=	DipSw.9=ON	DipSw.9=	
	DipSw.10=	DipSw.10=	DipSw.10=ON	
	DipSw.11=ON	DipSw.11=ON	DipSw.11=ON	
	DipSw.12=	DipSw.12=	DipSw.12=	
	•	•	DD	
	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	OCODER
	1 Pulse / 0.1 Gal	1 Pulse / 0.01 FT <sup>3</sup>	1 Pulse / 0.001 M <sup>3</sup>	
		-		
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	ECODED
	1 Pulse / 1 Gal	1 Pulse / 0.1 FT <sup>3</sup>	1 Pulse / 0.01 M <sup>3</sup>	LCODER
1 5" 3" 3" 4"	DipSw.1=ON	DipSw.1=ON	DipSw.1=ON	Special Case! -
1.5,2,5,4	DinSw 2=	DinSw 2=	DinSw 2=	For 1 5" T-10 with E-Coder
	DipSw 3=	DipSw 3=ON	DipSw 3=	
	DipSw 4=	DipSw 4=	DipSw 4=ON	DinSw 1=ON
	Dip3W.4=	Dip3W.4=	Dipow.4-ON	DipSw 2=
	DinSw E-	DinSw E-	DipSw E-	DipSw 3-
	DipSw.5-	DipSw.5-	DipSw.6-ON	DipSw 4-ON
		DinSw 7-	DipSw 7-	
	DipSw 8-	DipSw.7 –	DipSw 8-	DinSw 5=
	Dipow.o-	51950.0-	519500-	DipSw 6=ON
	Di-C 0	Di-C 0	Discus 0 - ON	
	DipSw.9=	DipSw.9=	DipSw.9=ON	DipSw.7=
	DipSw.10=	DipSw.10=	DipSw.10=	DipSw.8=
	DipSW.11=	DipSw.11=ON	DipSw.11=UN	Di-C 0-
	DipSw.12=	DipSw.12=	DipSw.12=	
	Newsol Consid Parlance	Normal Crossed Datase	Namual Crossed Bulance	DIPSW.10=ON
	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	DIPSW.11=ON
	1 Puise / 1 Gai	1 Pulse / 0.1 FT	1 Pulse / 0.01 M <sup>3</sup>	DipSw.12=
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	Normal Speed Pulse:
	1 Pulse / 10 Gal	1 Pulse / 1 FT <sup>3</sup>	1 Pulse / 0.1 M <sup>3</sup>	1 Pulse / 0.001 M <sup>3</sup>
				Low Speed Pulse:
	-	-	-	1 Pulse / 0.01 M <sup>3</sup>
6"-12"	DipSw.1=ON	DipSw.1=ON	DipSw.1=ON	
	DipSw.2=	DipSw.2=	DipSw.2=	
	DipSw.3=	DipSw.3=ON	DipSw.3=	
	DipSw.4=	DipSw.4=	DipSw.4=ON	
	_	_		
	DipSw.5=	DipSw.5=	DipSw.5=	
	DipSw.6=ON	DipSw.6=ON	DipSw.6=ON	
	DipSw.7=	DipSw.7=	DipSw.7=	
	DipSw.8=	DipSw.8=	DipSw.8=	
	DipSw.9=ON	DipSw.9=	DipSw.9=	
	DipSw.10=	DipSw.10=	DipSw.10=	
	DipSw.11=	DipSw.11=	DipSw.11=ON	
	DipSw.12=	DipSw.12=	DipSw.12=	
	·····			
	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	
	1 Pulse / 10 Gal	1 Pulse / 1 FT <sup>3</sup>	1 Pulse / 0.1 M <sup>3</sup>	
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	
	1 Pulse / 100 Gal	1 Pulse / 10 FT <sup>3</sup>	1 Pulse / 1 M <sup>3</sup>	
16″	DipSw.1=ON	DipSw.1=ON	DipSw.1=ON	
	DipSw.2=	DipSw.2=	DipSw.2=	
	DipSw.3=	DipSw.3=ON	DipSw.3=	
	DipSw.4=	DipSw.4=	DipSw.4=ON	
	DipSw.5=	DipSw.5=	DipSw.5=	
	DipSw.6=ON	DipSw.6=ON	DipSw.6=ON	
	DipSw.7=	DipSw.7=	DipSw.7=	
	DipSw.8=	DipSw.8=	DipSw.8=	
	DipSw.9=	DipSw.9=ON	DipSw.9=	
	DipSw.10=ON	DipSw.10=	DipSw.10=	
	DipSw.11=	DipSw.11=	DipSw.11=	
	DipSw.12=	DipSw.12=	DipSw.12=	
1		1	1	
	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	
	1 Pulse / 100 Gal	1 Pulse / 10 FT <sup>3</sup>	1 Pulse / 1 M <sup>3</sup>	
			1	
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	
	1 Pulse / 1000 Gal	1 Pulse / 100 FT <sup>3</sup>	1 Pulse / 10 M <sup>3</sup>	

# **NEPTUNE WATER METERS** – PERSONALITY SETTINGS FOR NEPTUNE WATER METERS (CONT).

Recommended DIP Switches 13-16 for <u>MACH-10</u>, <u>ProCoder</u>, <u>E-CODER</u>, and <u>WaterFlux 3070</u> Registers:

The Following \*Suggested\* Flow Span Settings, and May Need To Be Adjusted Based on Anticipated Max Flow Conditions.

Size	Gallon , Cubic Feet , Cubic Meters
5/8" MACH-10, T10	DipSw.13=
	DipSw.14=
20 gpm	DipSw.15=
75 lpm	DipSw.16=
3/4" MACH-10, T10	DipSw.13=ON
	DipSw.14=
30 gpm	DipSw.15=
120 lpm	DipSw.16=
1″ MACH-10, T10	DipSw.13=
	DipSw.14=ON
50 gpm	DipSw.15=
200 lpm	DipSw.16=
1.5" MACH-10, T10	DipSw.13=
	DipSw.14=
125 gpm	DipSw.15=ON
475 lpm	DipSw.16=
2" MACH-10, T10, 1.5-2" HPT	DipSw.13=ON
	DipSw.14=
200 gpm	DipSw.15=ON
750 lpm	DipSw.16=
3" MACH-10, HPT	DipSw.13=ON
500	DIPSW.14=ON
500 gpm	DipSw.15=ON
	DIPSW.16=
4" MACH-10, HP1	DIPSW.13=ON
1200 anm	
4500 Jpm	
	DipSw.10-ON
0 MACII-10, IIF I	DipSw.13=ON DipSw.14=ON
3000 apm	DipSw 15-
11000 lpm	DipSw 16=0N
8" MACH-10 HPT	DipSw 13=
o mach io, m i	DipSw 14=
4600 apm	DipSw 15=ON
17500 lpm	DipSw.16=ON
10" MACH-10, HPT	DipSw.13=ON
20 10:00 20,000	DipSw.14=
7300 apm	DipSw.15=ON
27500 lpm	DipSw.16=ON
12" MACH-10, HPT	DipSw.13=
	DipSw.14=ON
11400 gpm	DipSw.15=ON
43000 lpm	DipSw.16=ON
16" MACH-10, HPT	DipSw.13=ON
	DipSw.14=ON
18000 gpm	DipSw.15=ON
68000 lpm	DipSw.16=ON

# **NON-STANDARD SAMPLING TIMES -**

## FAST-REACTION BATCHING METERS

(a) Fast-Reaction Batching Control Meters require ultra-fast reaction time (1 sec). Please ensure that the connected encoder-type flow meter can tolerate ultra-short sample periods (i.e. battery issues).

When the Internal Jumper<sup>(1)</sup> is installed onto the Signalizer Factory Header as illustrated below, then the interrogation sample timings are activated accordingly:

Signalizer Sample Period Setting (sec) DIP Switch Settings	Non-Standard Sample Period (sec)	
5	1	Use for Fast Batch Control
10	8	
15	16	Valid Settings
30	32	for
60	64	Flow-IQ 3200
300	128 (OK for Mach-10)	
600	640 (OK for Mach-10)	
900	960 (OK for Mach-10)	

Signalizer Sample Period Setting (sec) DIP Switch Settings	Non-Standard Sample Period (sec)	
5	1	0
10	2	se fo Fast 3atcl ontr
15	3	<u>o</u> <del>-</del> 9
30	32	
60	64	Alto Pe
300	128 (OK for MACH-10)	mp
600	640 (OK for MACH-10)	is le te
900	960 (OK for MACH-10)	

(1) Requires Setting of "Non-Standard Sampling Mode" Activation Jumper. User Must Open Device Case, and Set Shunt Jumper on Circuit Board Utility Header:





Activate Non-Standard Sampling Mode

De-Activate Non-Standard Sampling Mode

# **201L LIQUID FILLED 201D Dry** LOWER MOUNT



Glycerine filled for added durability in applications where vibration or pulsation is present Stainless steel case and bezel, copper alloy internals

SPECIFICATIONS	6								
Dial Case Wetted Parts Bezel Lens Pointer Connection	1 ½" (4 4" (100 Stainle Coppe Stainle Polyca Black a Lower 1 ½" di 2 ½" dial 2 ½" dial Standa Single		Real Provide Action of the second sec	50 3 4 5 6 Million Mil					
Accuracy	3-2-3%	rade B	AVAILABLE OP	AILABLE OPTIONS* ertificate of Accuracy, NIST traceable ustom Dial iquid Fill Options, see page 176					
Ambient Temp	Glycer Dry = -	aueA	<ul> <li>Certificate of A</li> <li>Custom Dial</li> </ul>	ccuracy, NIST	traceable				
	A	-	в –	→		<ul> <li>Glass Lens</li> <li>Dry, Fillable Case</li> <li>Cleaned for Oxygen Service (dry only</li> <li>Special Connection Size</li> <li>Protective Rubber Cover, see page 12</li> <li>Max/Min Pointer, see page 122</li> <li>*Lead times/minimums may apply</li> </ul>			
		¥_			 c		BOX QUANTITI	ES Est Unit	Box Otv
E				目	_↓↓			Weight	DOX QUY
Dial II	nit A	B	C	<b>⊭Е</b> ≯	F		1 1⁄2"	0.20 lbs (0.10 kg)	100
1 ½"	1.85"	1.00"	0.67"	2.28"	 1∕8" NPT		2"	0.40 lbs (0.18 kg)	100
In.	1 47 2.27"	25 1.20"	17 0.91"	58 2.95"	1/8" or 1/4"		2 1⁄2"	0.55 lbs (0.24 kg)	50
2" mn	n 58	31	23	75	NPT		4"	1.5 lbs (0.68 kg)	30
2 ½" In.	2.80" 1 71	1.40" 36	1.07" 27	3.55" 90	1⁄4" NPT		I	· · · · ·	

5.21"

132

1/4" or 1/2"

NPT

1.17"

30

2

4"

ln.

mm

4.29"

109

1.75"

45

# 4" METER MATERIAL

CONSOLIDATED PIPE & SUPPLY 1500 COUNTY HOSPITAL ROAD NASHVILLE TN, 37218



# **IRON STRONG**

McWaneDuctile.com

TYTON® JOINT PIPE

3″-36″



McWane Ductile is a division of McWane, Inc.

# TYTON<sup>®</sup> JOINT PIPE FROM MCWANE DUCTILE

Tyton Joint<sup>®</sup> pipe is manufactured by McWane Ductile in 3" to 36" diameters in standard and pressure classes.

The Tyton Joint was brought to market in the mid-1950s and has been modified periodically ever since. The Tyton Joint is the most widely used gasketing system for pipe in North America and around the world. McWane Ductile's Tyton Joint provides 5 degrees of deflection, allowing easy pipeline routing around obstacles with a minimal amount of fittings. McWane Ductile offers Tyton Joint pipe with various lining options, including single and double thickness cement, Protecto 401 or bare. Exterior coating options include standard asphaltic paint, zinc or bare. Please contact your local sales representative for more information.

# **DETAILS & DIMENSIONS**



PIPE SIZE IN.	PIPE THIC	CKNESS IN.	OUTSIDE DIAMETER	*DIMENS	<b>B</b> 3.00				
	FROM	то	IN.	A	В				
3	.25	.40	3.96	5.80	3.00				
4	.25 .41		4.80	7.10	3.15				
6	.25 .43		6.90	8.63	3.38				
8	.25 .45		9.05	10.94	3.69				
10	.26 .47		11.10	13.32	3.75				
12	.28	.49	13.20	15.06	3.75				
14	.28	.51	15.30	17.80	5.00				
16	.30	.52	17.40	19.98	5.00				
18	.31	.53	19.50	22.00	5.00				
20	.33	.54	21.60	24.12	5.25				
24	.33	.56	25.80	28.43	5.50				
30	.34	.63	32.00	35.40	6.55				
36	.38	.73	38.30	41.84	7.00				
*Nominal laying ler	igth is 18 ft.								

# DIMENSIONS AND WEIGHTS FOR SPECIAL CLASSES OF PUSH-ON DUCTILE IRON PIPE

				WT. OF	TYTON <sup>®</sup> JOINT					
PIPE	THICKNESS	NOMINAL	BARREL		WT OF		AVG. WT.			
IN.	CLASS	IN.	IN.	LB.	BELL LB.	LGTH. <sup>†</sup> LB.	LB.			
3	52	0.28	3.96	9.9	7	185	10.3			
3	54	0.34	3.96	11.8	7	220	12.2			
3	56	0.40	3.96	13.7	7	255	14.1			
4	52	0.26	4.80	12.6	9	235	1.8			
4	53	0.32	4.80	13.8	9	255	14.3			
4	54	0.35	4.80	15	9	280	15.5			
4	56	0.41	4.80	17.3	9	320	17.8			
6	50 51	0.25	6.90	16	11	300	16.6			
6	52	0.28	6.90	19.6	11	365	20.2			
6	53	0.34	6.90	21.4	11	395	22.0			
6	54	0.37	6.90	23.2	11	430	23.8			
6	55	0.40	6.90	25	11	460	25.6			
6	50	0.43	9.90	26.7	17	490	27.3			
8	51	0.30	9.05	25.2	17	470	26.1			
8	52	0.33	9.05	27.7	17	515	28.6			
8	53	0.36	9.05	30.1	17	560	31.0			
8	54	0.39	9.05	32.5	17	600	33.4			
8	56	0.42	9.05	37.2	17	685	381			
10	50	0.29	11.10	30.1	24	565	31.4			
10	51	0.32	11.10	33.2	24	620	34.5			
10	52	0.35	11.10	36.2	24	675	37.5			
10	53	0.38	11.10	39.2	24	730	40.5			
10	54	0.41	11.10	42.1	24	835	45.4			
10	56	0.47	11.10	48	24	890	49.3			
12	50	0.31	13.20	38.4	29	720	40.0			
12	51	0.34	13.20	42	29	785	43.6			
12	52	0.37	13.20	45.6	29	850	47.2			
12	53	0.40	13.20	49.2	29	915	50.8			
12	55	0.46	13.20	56.3	29	1040	57.9			
12	56	0.49	13.20	59.9	29	1105	61.5			
14	50	0.33	15.30	47.5	45	900	50.0			
14	51	0.36	15.30	51.7	45	975	54.2			
14	52	0.39	15.30	<u>55.9</u>	45	1050	58.4			
14	53	0.42	15.30	64.2	45	1200	66.7			
14	55	0.48	15.30	68.4	45	1275	70.9			
14	56	0.51	15.30	72.5	45	1350	75.0			
16	50	0.34	17.40	55.8	54	1060	58.8			
16	51	0.37	17.40	60.6	54	1230	63.6			
16	53	0.40	17.40	701	54	1315	731			
16	54	0.46	17.40	74.9	54	1400	77.9			
16	55	0.49	17.40	79.7	54	1490	82.7			
16	56	0.52	17.40	84.4	54	1575	87.4			
18	50	0.35	19.50	64.4	59	1220	6/./ 731			
18	52	0.38	19.50	75.2	59	1415	78.5			
18	53	0.44	19.50	80.6	59	1510	83.9			
18	54	0.47	19.50	86	59	1605	89.3			
18	55	0.50	19.50	91.3	59	1700	94.6			
18	50	0.53	2160	96./	59 74	1295	776			
20	51	0.39	21.60	79.5	74	1505	83.6			
20	52	0.42	21.60	85.5	74	1615	89.6			
20	53	0.45	21.60	91.5	74	1720	95.6			
20	54	0.48	21.60	97.5	74	1830	101.6			
20	55	0.51	21.60	109.4	74	2040	107.5			
24	50	0.38	25.80	92.9	95	1765	98.2			
24	51	0.41	25.80	100.1	95	1895	105.4			
24	52	0.44	25.80	107.3	95	2025	112.6			
24	53	0.47	25.80	114.4	95	2155	119.7			
24	55	0.50	25.80	128.8	95	∠385 2415	126.9			
24	56	0.56	25.80	135.9	95	2540	141.2			
30	50	0.39	32.00	118.5	139	2270	126.2			
30	51	0.43	32.00	130.5	139	2490	138.2			
30	52	0.47	32.00	142.5	139	2705	150.2			
30	53	0.51	32.00	154.4	139	2920	102.1 174 0			
30	55	0.59	32.00	178.2	139	3345	185.9			
30	56	0.63	32.00	190.0	139	3560	197.7			
36	50	0.43	38.30	156.5	184	3000	166.7			
36	51	0.48	38.30	174.5	184	3325	184.7			
36	52	0.55	30.30	210 3	184	3045	202.6			
36	54	0.63	38.30	228.1	184	4290	238.3			
36	55	0.68	38.30	245.9	184	4610	256.1			
36	56	0.73	38.30	263.7	184	4930	273.9			

# STANDARD DIMENSIONS AND WEIGHTS OF 3" THROUGH 36" PUSH-ON JOINT DUCTILE IRON PIPE

				WT. OF	TYTON <sup>®</sup> JOINT			
PIPE SIZE IN.	PRESSURE CLASS PSI	NOMINAL THICKNESS IN.	OD* IN.	BARREL PER FT. † LB.	WT. OF BELL LB.	WT. PER LGTH.† LB.	AVG. WT. PER FT.‡ LB.	
3	350	0.25	3.96	8.90	7.00	185	9.20	
4	350	0.25	4.80	10.90	9.00	225	11.30	
6	350	0.25	6.90	16.00	11.00	300	16.60	
8	350	0.25	9.05	21.10	17.00	395	22.00	
10	350	0.26	11.10	27.10	24.00	510	28.40	
12	350	0.28	13.20	34.80	29.00	655	36.40	
	250	0.28	15.30	40.40	45.00	770	42.90	
14	300	0.30	15.30	43.30	45.00	825	45.80	
	350	0.31	15.30	44.70	45.00	850	47.20	
	250	0.30	17.40	49.30	54.00	940	52.30	
16	300	0.32	17.40	52.50	54.00	1000	55.50	
	350	0.34	17.40	55.80	54.00	1060	58.80	
	250	0.31	19.50	57.20	59.00	1090	60.50	
18	300	0.34	19.50	62.60	59.00	1185	65.90	
	350	0.36	19.50	66.20	59.00	1250	69.50	
	250	0.33	21.60	67.50	74.00	1290	71.60	
20	300	0.36	21.60	73.50	74.00	1395	77.60	
	350	0.38	21.60	77.50	74.00	1470	81.60	
	200	0.33	25.80	80.80	95.00	1550	86.10	
24	250	0.37	25.80	90.50	95.00	1725	95.80	
24	300	0.40	25.80	97.70	95.00	1855	103.00	
	350	0.43	25.80	104.90	95.00	1985	110.20	
	150	0.34	32.00	103.50	139.00	2000	111.20	
	200	0.38	32.00	115.50	139.00	2220	123.20	
30	250	0.42	32.00	127.50	139.00	2435	135.20	
	300	0.45	32.00	136.50	139.00	2595	144.20	
	350	0.49	32.00	148.40	139.00	2810	156.10	
	150	0.38	38.30	138.50	184.00	2675	148.70	
	200	0.42	38.30	152.90	184.00	2935	163.10	
36	250	0.47	38.30	170.90	184.00	3260	181.10	
	300	0.51	38.30	185.30	184.00	3520	195.50	
	350	0.56	38.30	203.20	184.00	3840	213.40	

 $^{\scriptscriptstyle \dagger}$   $\,$  Including bell; calculated weight of pipe rounded off to the nearest 5 lb.

 $\ddagger\,$  Including bell; average weight per foot, based on calculated weight of pipe before rounding.

\* Tolerances of OD of spigot end: 3 –12 in. = +0.06 in. & -0.06 in. ; 14–24 in. = +0.05 in. & -0.08 in. ; 30–36 in. = +0.08 in. & -0.06 in.



#### TYTON<sup>®</sup> JOINT PIPE MAXIMUM ALLOWABLE JOINT DEFLECTION

PIPE SIZE IN.	Y-MAXIMUM JOINT DEFLECTION IN DEGREES	X DEFLECTION IN INCHES 18 FT. LENGTH	APPROXIMATE RADIUS IN FT. OF CURVE PRODUCED BY SUCCESSION OF JOINTS 18 FT. LENGTH
3	5°	19	206
4	5°	19	206
6	5°	19	206
8	5°	19	206
10	5°	19	206
12	5°	19	206
14	5°	19	206
16	5°	19	206
18	5°	19	206
20	5°	19	206
24	5°	19	206
30	5°	19	206
36	5°	19	206

Note: If using Sure Stop 350  $^{\rm e}$  locking gaskets, please refer to the deflection limits for that product.

# **TYTON JOINT® ASSEMBLY INSTRUCTIONS**

STEP 1. Thoroughly clean out the bell with special attention to the gasket recess. Remove any foreign material or excess paint. Clean the spigot or beveled plain end and remove any sharp edges with a standard file.

**STEP 2.** After making sure

that the correct

gasket is being

used, insert it into

facing the bell face.

the recess in the bell with the small end of the gasket



**STEP 3.** Apply lubricant to the inside surface of the gasket, making sure that the entire surface is coated. Apply a generous coating of lubricant to the beveled portion of the plain end.

**PAGE 38** 



STEP 4. Guide the plain end into the bell, and while maintaining straight alignment, push the plain end into the bell socket. Once the joint is assembled, necessary deflection can be accomplished.



#### STANDARDS APPLICABLE TO DUCTILE IRON PIPE AND FITTINGS

STEP 2

THICKNESS DESIGN OF DUCTILE IRON PIPE	ANSI/AWWA C150/A21.50
DUCTILE IRON PIPE FOR WATER AND OTHER LIQUIDS	ANSI/AWWA C151/A21.51, FEDERAL WWP421D, GRADE C
DUCTILE IRON PIPE FOR GRAVITY FLOW SERVICE	ANSI/ASTM A746
DUCTILE IRON FITTINGS FOR WATER AND OTHER LIQUIDS (3 in. through 36 in.)	ANSI/AWWA C110/A21.10
DUCTILE IRON COMPACT FITTINGS (3 in. through 24 in.)	ANSI/AWWA C153/A21.53
FLANGED FITTINGS	ANSI/AWWA C110/A21.10, ANSI B16.1
DUCTILE IRON PIPE WITH THREADED FLANGES	ANSI/AWWA C115/21.15
COATINGS AND LININGS	
Asphaltic	ANSI/AWWA C151/A21.51, ANSI/AWWA C110/A21.10, ANSI/AWWA C153/A21.53
Cement Lining	ANSI/AWWA C104/A21.4
Various Epoxy Linings and Coatings	MANUFACTURER'S STANDARD
Exterior Polyethylene Encasement	ANSI/AWWA C105/A21.5
JOINTS - PIPE AND FITTINGS	
Push-On and Mechanical Rubber-Gasket Joints	ANSI/AWWA C111/A21.11, FEDERAL WWP421D
Flanged	ANSI/AWWA C115/A21.15, ANSI B16.1
Grooved and Shouldered	ANSI/AWWA C606
PIPE THREADS	ANSI B2.1
INSTALLATION	ANSI/AWWA C600

Tyton<sup>®</sup> and Tyton Joint<sup>®</sup> are registered trademarks of US Pipe and Foundry.



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Rev. January 2022



## Mueller Co.

CONSOLIDATED PIPE & SUPPLY CO. INC. 1500 COUNTY HOSPITAL RD NASHVILLE TN 37218

# 3"- 12" A-2361 RESILIENT WPPGEE 39 GATE VALVES - M.J. x M.J.

Rev. 4-20

- Catalog number A-2361-20 Mechanical joint ends (with accessories unassembled) A-2361-23 Mechanical joint ends (less accessories) A-2361-25 Mechanical joint ends (with transition gaskets accessories unassembled)
- □ Sizes 3", <mark>4",</mark> 6", 8", 10", 12"
- Non-rising stem (NRS)
- Meets or exceeds all applicable requirements of ANSI/AWWA C515\*\*\* Standard, UL 262 Listed, FM 1120/1130 Approved, and certified to ANSI/NSF 61 & 372
- Standard mechanical joint ends comply with ANSI/AWWA C111
- Nominal 10 mils Mueller Pro-Gard<sup>®</sup> Fusion Bonded Epoxy coated interior and exterior surfaces Epoxy coating meets or exceeds all applicable requirements of ANSI/AWWA C550 Standard
- □ Iron wedge, symmetrical and fully encapsulated with molded rubber; no exposed iron
- Triple O-ring seal (2 above the thrust collar and 1 below)
- 2" square wrench nut open left or open right
- 350 psig (2400 kPa/24 barg) maximum working pressure; 700 psig (4800 kPa/48 barg) static test pressure
- UL Listed, FM Approved: 350 psig (2400 kPa/24 barg)
- Designed for potable water applications



A-2361-20 shown

#### Options

#### See page 10.54 for more information on Resilient Wedge Gate Valve options

- Position indicators
- □ Low zinc, silicon bronze ASTM B98-C66100/H02 stem
- Handwheel

□ Stainless steel stem: Type 304, Type 316

EPDM Disc and o-rings

#### Resilient wedge gate valve parts

Catalog Part Number	Description	Material	Material Standard
G-16	Bonnet Bolts & Nuts	316 Stainless Steel	ASTM F593 (bolt) ASTM F594 (nut)
G-41	Stuffing Box Bolts & Nuts	316 Stainless Steel	ASTM F593 (bolt) ASTM F594 (nut)
G-49	Stem O-rings (3)	Nitrile	ASTM D2000
G-200	Wrench Nut Cap Screw	316 Stainless Steel	ASTM F593
G-201	Stuffing Box O-ring	Nitrile	ASTM D2000
G-202	Wrench Nut	Ductile Iron	ASTM A536 ▼
G-203	Stem	Bronze	ASTM B138
G-204	Hand Wheel (not shown)	Cast Iron +	ASTM A126 CL.B
G-205	Stem Nut	Bronze	ASTM B584
G-206	Guide Cap Bearings	Acetal	-
G-207	Stuffing Box with dirt seal	Ductile Iron Nitrile	ASTM A536 ▼ ASTM D2000
G-208	Anti-friction Washers (2)	Acetal	-
G-209	Wedge, Rubber Encapsulation	Ductile Iron* SBR	ASTM A536 ▼ ASTM D2000
G-210	Bonnet	Ductile Iron	ASTM A536 ▼
G-211	Bonnet O-ring +++	Nitrile	ASTM D2000
G-212	Body	Ductile Iron	ASTM A536 ▼



+++ 3" valves use a bonnet gasket

\*Fully encapsulated in molded rubber with no iron exposed;

▼ Material strength ASTM A536 65-45 minimum

+ Manufacturer's option to change material to ductile iron ASTM A536

\*\*\* 3" valves meet or exceed all applicable requirements of ANSI/AWWA C509 Standard



 $\langle \cdot \rangle$ 

Mueller Co.)

Rev. 2-17

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CONSOLIDATED PIPE & SUPPLY CO. INC. 1500 COUNTY HOSPITAL RD NASHVILLE TN 37218

# § Α O œ٦ TT Ŧ Щ 00 Ν DD FF

#### Dimensions

Dimension			Nomin	al Size		
Differiatori	3"	4"	6"	8"	10"	12"
A	12.38	14.19	18.00	21.50	25.50	28.62
FF	9.62	9.50	10.00	10.50	11.50	12.00
L	2.50	2.50	2.50	2.50	2.50	2.50
N	7.50	8.40	10.41 12		15.24	18.024
O (number and size of holes)	488	488	688	688	888	888
DD	4.62	4.50	5.00	5.50	6.50	7.00
Q	3.30	4.30	6.30	8.30	10.30	12.30
OO (bolt circle diameter)	6.19	7.50	9.50	11.75	14.00	16.25
Turns to open	11	14	20.5	26.5	33.0	38.5
Weight*	83	70	112	162	238	303

\*All dimensions are in inches. All weights include accessories are in pounds and are approximate.



Quality - Service - Commitment - Delivered.

# C153 DUCTILE IRON MECHANICAL JOINT FITTINGS

# C153 DUCTILE IRON MECHANICAL JOINT FITTINGS BASIC SPECIFICATIONS

SIZES: MATERIAL: PRESSURE:	<ul> <li>2" - 64"</li> <li>Ductile Iron ASTM A536, Grade 65-45-12, 60-42-10 or 70-50-05.</li> <li>350 PSI Water Working Pressure 2"- 24".</li> <li>250 PSI Water Working Pressure 30"- 48".</li> <li>150 PSI Water Working Pressure 54"- 64".</li> </ul>
TESTING:	<ul> <li>In accordance with ANSI/AWWA C153/A21.53.</li> <li>In accordance with UL - FM requirements.</li> <li>All fittings are hydrostatically tested in accordance with SIGMA Quality Management Standard.</li> <li>All fittings are heat coded to ensure traceability and verification of metallurgical properties in accordance with the prevailing standards and SIGMA Quality Management Standards.</li> </ul>
LAYING LENGTH:	<ul> <li>Short body design - straight section of body deleted to provide a compact and lighter fitting without reducing strength or flow characteristics.</li> <li>In accordance with ANSI/AWWA C153/A21.53.</li> </ul>
DEFLECTION:	<ul> <li>Maximum allowable deflection for MJ Joint on a full length pipe is as mentioned below:</li> <li>3" - 4" = 8 Degrees</li> <li>6" = 7 Degrees</li> <li>8" - 12" = 5 Degrees</li> <li>14" - 48" = 3 Degrees</li> </ul>
CEMENT LINING:	• Maximum Double cement lined in accordance with ANSI/AWWA C104/A21.4.
COATING:	<ul> <li>Interior of fitting is seal coated (asphaltic material) in accordance with ANSI/ AWWA C104/A21.4 and NSF61 approved.</li> <li>Exterior of fitting is seal coated (asphaltic material) in accordance with ANSI/ AWWA C153/A21.53 and NSF approved.</li> </ul>
GASKETS:	<ul> <li>SBR in accordance with ANSI/AWWA C111/A21.11.</li> <li>Also available in EPDM, NBR and CR.</li> </ul>
T-BOLTS:	• Low Alloy corrosion resistant high strength steel in accordance with ANSI/AWWA C111/A21.11.
APPROVALS:	• 3"-16" Underwriters Laboratories listed and Factory Mutual Approved.
STANDARDS:	<ul> <li>Certified to NSF61 Standard including Annex G &amp; 372.</li> <li>ANSI/AWWA C153/A21.53 for Compact Ductile Iron Fittings 2"-64" for water and other liquids.</li> </ul>
INSTALLATION:	• Per ANSI/AWWA C600 and C111 using DIP conforming to C150/C151 and PVC pipe conforming to C900/C905.





CONSOLIDATED PIPE & SUPPLY CO. INC. 1500 COUNTY HOSPITAL RD NASHVILLE TN 37218 PAGE 42 **SIGMA** M Quality – Service – Commitment – Delivered.

# ONE-LOK<sup>™</sup> MODEL SLCE WEDGE RESTRAINT FOR PVC PIPE







# **PRODUCT SPECIFICATIONS**

MATERIAL:	<ul> <li>Gland body, wedge inserts and break-off top actuating bolts are manufactured of high strength ductile iron in accordance with ASTM A536, Grade 65-45-12.</li> </ul>
SIZE RANGE:	• 3" - 36", 42" 54", 60"
DIMENSION:	• Conform to ANSI/AWWA C111/A21.11 & ANSI/AWWA C153/A21.53 standards
PRESSURE RATING:	• Equal to the water working pressure rating of the pipe upon which it is installed with a minimum 2:1 factor of safety.
COATING:	<ul> <li>Red Alkyd paint</li> <li>Electro-deposition "CORRSAFE™" available upon request. For further information, please refer to our CORRSAFE Product Information sheet at http://www.sigmaco.com/pipe-restraint-product-coatings-linings/</li> </ul>
APPROVALS:	<ul> <li>Underwriters Laboratories' listed in sizes 4"-12" to ASTM F1674 (latest revision) and Factory Mutual approved in sizes 4"-12".</li> </ul>
DEFLECTION:	<ul> <li>5° on 3"-12", 2° on 14"-16", 1.5° on 18"-30" and 1° on 36", 42" 54" and 60"</li> </ul>
TRACEABILITY:	<ul> <li>Gland body, wedge inserts and break-off top actuating bolts are individually cast with exact heat code information.</li> </ul>
INSTALLATION:	<ul> <li>In accordance with manufacturer's recommendation and applicable AWWA stan- dards.</li> </ul>



# ONE-LOK<sup>™</sup> Series SLCE for PVC Pipe



#### Sample Specification:

Restraint for standard mechanical joint fittings shall be incorporated in the design of the follower gland and shall utilize multiple wedge segments that act against the pipe, increasing their resistance as the line pressure increases. The assembled joint shall maintain the maximum flexibility and deflection of all nominal pipe sizes after burial. Restraining gland, wedge segments, and actuating bolts shall be manufactured of high strength ductile iron conforming to the requirements of ASTM A536, Grade 65-45-12. Dimensions shall be compatible with standardized mechanical joints conforming to the requirements AWWA C111/ANSI A21.11 and AWWA C153/ANSI 21.53 through 24" (latest revision). Breakaway tops shall be incorporated in the design of the actuating bolts to visually ensure proper torque. The manufacturing of the actuating bolt must incorporate a quality control procedure that is deemed acceptable by the specifier and positively assures precise and consistent operating torque of the breakaway top. The mechanical joint restraining devices shall have a working pressure rating of 235 psi and provide no less than a safety factor of 2:1. Restraint shall be FM approved in applicable sizes. Restraining device shall be SIGMA ONE-LOK<sup>™</sup> or approved equal.

#### Material:

F

- Gland body, brackets, wedge segments & actuating bolts ASTM A536 65-45-12 ductile iron.
- Restraining Rods & Nuts: High strength, low alloy steel meeting AWWA/ANSI C111/A21.11 with minimum 65,000 psi tensile strength and 45,000 psi yield strength.





#### Dimensions in Inches, Weights in Pounds

Cine	litere #	Moinht	PVC Pipe	IPS Pipe				Dime	nsions				Bolts and Inserts			T-bolts			Gasket	
Size	item #	weight	DIOD	OD	С	F	K2	т	Р	P*	х	J	No	Size	Torque	No	Size	Torque	No	Item #
3	SLCE3	6.21		3.50	4.76	3.60	7.18	0.60	9.42	8.50	0.750	6.14	2	7/8	45-55	4	5/8 x 3.0	45-60	1	TG3
4	SLCE4	6.78	4.80	4.50	5.92	4.90	7.92	0.60	10.22	9.30	0.875	7.50	2	7/8	50-60	4	³∕₄ x 3.5	80-90	1	MG4
6	SLCE6	10.28	6.90	<mark>6.63</mark>	8.01	7.00	10.00	0.60	12.87	11.95	0.875	9.50	3	7/8	50-60	6	³∕₄ x 3.5	80-90	1	MG6
8	SLCE8	14.48	9.05	<mark>8.63</mark>	10.17	9.15	12.18	0.75	14.37	13.45	0.875	11.75	4	7/8	50-60	6	³⁄₄ x 4.0	80-90	1	MG8
10	SLCE10	21.40	11.10	10.75	12.22	11.20	14.60	0.85	16.68	15.76	0.875	14.00	6	7/8	50-60	8	³∕₄ x 4.0	80-90	1	MG10
12	SLCE12	26.96	13.20	12.75	14.32	13.30	16.64	0.85	18.58	17.66	0.875	16.25	8	7/8	50-60	8	³⁄₄ x 4.0	80-90	1	MG12
14	SLCE14	33.67	15.30		16.40	15.44	20.25	1.20	21.68	19.98	0.875	18.75	10	7/8	55-65	10	³∕₄ x 4.5	80-90	1	MG14
16	SLCE16	41.67	17.40		18.50	17.54	22.45	1.21	23.65	21.95	0.875	21.00	12	7/8	55-65	12	³⁄₄ x 4.5	80-90	1	MG16
18	SLCE18	49.50	19.50		20.60	19.64	24.75	1.25	25.79	24.09	0.875	23.25	12	7/8	55-65	12	³∕₄ x 4.5	80-90	1	MG18
20	SLCE20	61.17	21.60		22.70	21.74	27.00	1.34	28.16	26.46	0.875	25.50	14	7/8	55-65	14	³∕₄ x 5.0	80-90	1	MG20
24	SLCE24	79.33	25.80		26.90	25.94	31.50	1.46	32.70	31.00	0.875	30.00	16	7/8	55-65	16	³∕₄ x 5.0	80-90	1	MG24
30	SLCE30	198.00	32.00		33.29	32.17	38.42	2.00	41.92	39.92	1.125	36.88	20	1.00	65-75	20	1 x 6.5	100-120	1	MGS30
36	SLCE36	248.00	38.30		39.59	38.47	46.00	2.00	48.78	46.78	1.125	43.75	24	1.00	65-75	24	1 x 6.5	100-120	1	MGS36
42	SLCE42	660.00	44.50		45.76	44.80	58.80	3.15	59.59	57.93	1.375	50.62	14.00	1.00	65 - 75	28	1 1/4 x 8.0	120 - 150	1	MGS42
54	SLCE54	1022.000	57.56		58.85	57.73	67.50	4.50	72.1	70.5	1.375	63.2	18	1 1/4	105 - 115	36	1 1/4 x 11	120 - 150	1	MGS54
60	SLCE60	1115.000	61.61		62.90	61.78	72.00	4.50	77.4	75.75	1.375	67.72	18	1 1/4	105 - 115	36	1 1/4 x 11	120 - 150	1	MGS60

Note: P\* With break off bolts broken head

Weight does not include any accessories like T-bolt + Gasket. There could be +/- 5% variation in the weight.



Sizes 4" - 12" are UL listed and have been tested in accordance with ASTM F1674. Sizes 4" - 12" are FM approved on AWWA C900 pipe.



# ONE-LOK<sup>™</sup> MODEL SLDE WEDGE RESTRAINT FOR DUCTILE IRON PIPE







# **PRODUCT SPECIFICATIONS**

MATERIAL:	<ul> <li>Gland body, wedge inserts and break-off top actuating bolts are manufactured of high strength ductile iron in accordance with ASTM A536, Grade 65-45-12. Wedge inserts are heat-treated to a hardness of 370 BHN minimum.</li> </ul>
SIZE RANGE:	• 3" through 64"
DIMENSION:	Conform to ANSI/AWWA C111/A21.11 & ANSI/AWWA C153/A21.53 standards
PRESSURE RATING:	• Sizes 3"-16" carry a 350 psi WWP and sizes 18"- 64" carry a 250 psi WWP while providing a minimum 2:1 factor of safety.
COATING:	<ul> <li>Asphaltic black enamel</li> <li>Electro-deposition "CORRSAFE™" available upon request. For further information, please refer to our CORRSAFE Product Information sheet at http://www.sigmaco.com/pipe-restraint-product-coatings-linings/</li> </ul>
APPROVALS:	<ul> <li>Underwriters Laboratories' listed in sizes 3"-36" and Factory Mutual approved in sizes 3"-12".</li> </ul>
DEFLECTION:	<ul> <li>5° on 3"-12", 2° on 14"-16", 1.5° on 18"-30" and 1° on 36"- 64"</li> </ul>
TRACEABILITY:	• Gland body, wedge inserts and break-off top actuating bolts are individually cast with exact heat code information.
INSTALLATION:	<ul> <li>In accordance with manufacturer's recommendation and applicable AWWA stan- dards.</li> </ul>



Note: This product is not designed to be used on plain end fittings.

# ONE-LOK<sup>™</sup> Series SLDE for Ductile Iron Pipe

#### Sample Specification:

Restraint for standard mechanical joint fittings shall be incorporated in the design of the follower gland and shall utilize multiple wedge segments that act against the pipe, increasing their resistance as the line pressure increases. The assembled joint shall maintain the maximum flexibility and deflection of all nominal pipe sizes after burial. Restraining gland, wedge segments, and actuating bolts shall be manufactured of high strength ductile iron conforming to the requirements of ASTM A536, Grade 65-45-12. Wedge segments shall be heat treated to a hardness of 370 BHN minimum. Dimensions shall be compatible with standardized mechanical joints conforming to the requirements AWWA C111/ANSI A21.11 and AWWA C153/ANSI 21.53 through 24" (latest revision). Breakaway tops shall be incorporated in the design of the actuating bolts to visually ensure proper torque. The manufacturing of the actuating bolt must incorporate a quality control procedure that is deemed acceptable by the specifier and positively assures precise and consistent operating torque of the breakaway top. The mechanical joint restraining devices shall have a working pressure rating of 350psi (for sizes 3-16") and 250 psi (for sizes 18-64") minimum and provide no less than a safety factor of 2:1. Restraint shall be UL Listed and FM approved in applicable sizes. Restraining device shall be SIGMA ONE-LOK<sup>™</sup> or approved equal.

#### Materials:

- Gland body, brackets, wedge segments & actuating bolts: ASTM A536 65-45-12 ductile iron.
- Wedge segments are heat treated to a minimum hardness of 370BHN
- T-head bolts & nuts: High strength, low alloy steel meeting AWWA/ANSI C111/A21.11 with minimum 65,000psi tensile strength and 45,000psi yield strength.





#### **Dimensions in Inches, Weights in Pounds**

Nom			Pipe				Dimen	sions				Bolts and Inserts		Pressure		T-bolts		G	asket	
Pipe Size	Item #	Wgt	OD	С	F	D	т	P*	В	J	K2	No	Size	Torque	Rating	No	Size	Torque	No	Item #
3	SLDE3	5.50	3.96	4.84	4.16	1.58	0.55	9.40	0.750	6.19	7.69	2	7/8	80-90	350	4	5/8 x 3.0	80-90	1	TG-3
4	SLDE4	<mark>6.50</mark>	4.80	<mark>5.92</mark>	<mark>5.00</mark>	<mark>1.58</mark>	0.55	10.24	0.875	7.50	<mark>9.12</mark>	2	7/8	80-90	<mark>350</mark>	4	³⁄₄ x 3.5	<mark>80-90</mark>	1	MG-4
6	SLDE6	10.00	6.90	8.02	7.10	1.58	0.60	12.34	0.875	9.50	11.12	3	7/8	80-90	350	6	¾ x 3.5	80-90	1	MG-6
8	SLDE8	14.50	9.05	10.17	9.25	1.63	0.75	14.32	0.875	11.75	13.37	4	7/8	80-90	350	6	³⁄₄ x 4.0	80-90	1	MG-8
10	SLDE10	23.00	11.10	12.22	11.30	1.58	0.85	16.54	0.875	14.00	15.62	6	7/8	80-90	350	8	¾ x 4.0	80-90	1	MG-10
12	SLDE12	29.00	13.20	14.32	13.40	1.58	0.85	18.80	0.875	16.25	17.88	8	7/8	80-90	350	8	³⁄₄ x 4.0	80-90	1	MG-12
14	SLDE14	39.60	15.30	16.40	15.55	1.58	1.125	21.20	0.875	18.75	20.25	10	7/8	80-90	350	10	¾ x 4.5	80-90	1	MG-14
16	SLDE16	49.67	17.40	18.50	17.54	1.77	1.21	23.74	0.875	21.00	22.50	12	7/8	80-90	350	12	³⁄₄ x 4.5	80-90	1	MG-16
18	SLDE18	60.33	19.50	20.60	19.64	1.77	1.25	25.84	0.875	23.25	24.75	12	7/8	80-90	250	12	¾ x 4.5	80-90	1	MG-18
20	SLDE20	69.00	21.60	22.70	21.74	1.87	1.25	27.94	0.875	25.50	27.00	14	7/8	80-90	250	14	¾ x 5.0	80-90	1	MG-20
24	SLDE24	103.67	25.80	26.88	25.95	1.92	1.47	32.14	0.875	30.00	31.50	16	7/8	80-90	250	16	³∕₄ x 5.0	80-90	1	MG-24
30*	SLDE30	158.67	32.00	33.29	32.17	2.13	1.65	39.30	1.125	36.88	39.12	20	1.00	115-125	250	20	1 x 6.5	100-120	1	MGS-30
36*	SLDE36	234.50	38.30	39.59	38.47	3.15	1.75	46.07	1.125	43.75	46	24	1.00	115-125	250	24	1 x 6.5	100-120	1	MGS-36
42*	SLDE42	344.00	44.50	45.79	44.67	3.56	2.25	53.25	1.38	50.62	53.38	28	1 1/4	115-125	250	28	1 ¼ x 8.0	120-150	1	MGS-42
48*	SLDE48	456.00	50.80	52.09	50.97	3.81	2.25	59.55	1.38	57.5	60.26	32	1 1/4	115-125	250	32	1 ¼ x 8.0	120-150	1	MGS-48
54*	SLDE54	1045.00	57.56	58.85	57.73	6.00	4.50	70.43	1.375	63.20	67.50	18	1½	400 +/- 5	250	36	1 ¼ x 11.0	150 - 200	1	MGS-54
60*	SLDE60	1136.00	61.61	62.90	61.78	6.00	4.50	74.52	1.375	67.72	72.00	18	11⁄2	400 +/- 5	250	36	1 ¼ x 11.0	150 - 200	1	MGS-60
64*	SLDE64	1258.00	65.67	66.96	65.84	6.00	4.50	78.68	1.375	71.86	76.00	19	11/2	400 +/- 5	250	38	1 ¼ x 11.0	150 - 200	1	MGS-64

ONE-LOK SLDE was previously referred to as model SLD

P\* Dim shows OD after head is broken/removed.

Sizes 3"-12" is approved for thinnest class of DI pipe.



#### \* Product is provided with SIGMASEAL ™ improved mechanical joint gasket.

Sizes 3" - 14" are UL listed for 350 psi on DI Pipe Sizes 16" are UL listed for 300 psi on DI Pipe Sizes 18" - 30" are UL listed for 250 psi on DI Pipe Sizes 36" are UL listed for 200 psi on DI Pipe Sizes 42" and 48" are pressure rated at 250 psi on DI Pipe Sizes 54", 60" and 64" are pressure rated at 250 psi on DI Pipe Sizes 4" - 12" are FM approved for 175 psi on DI pipe. CONSOLIDATED PIPE & SUPPLY 1500 COUNTY HOSPITAL ROAD NASHVILLE TN, 37218



# **IRON STRONG**

McWaneDuctile.com

# FABRICATED FLANGE AND WALL PIPE 3"-48"



McWane Ductile is a division of McWane, Inc.

# **FLANGE PIPE DETAILS & DIMENSIONS**

								NO FLG BOLT				NO MJ BOLT		
SIZE	A	С	ØD	ØE	ØG	Ø G1	н	HOLES	ØΙ	ØК	L.	HOLES	М	Р
3		0.31	3.96	6.00	7.50	7.69	0.63	4	0.75	6.19	0.88	4	0.75	2.50
4		0.32	4.80	7.50	9.00	9.12	0.82	8	0.75	7.50	0.94	4	0.88	2.50
6		0.34	6.90	9.50	11.00	11.12	0.88	8	0.88	9.50	1.00	6	0.88	2.50
8		0.36	9.05	11.75	13.50	13.37	1.00	8	0.88	11.75	1.04	6	0.88	2.50
10		0.38	11.10	14.25	16.00	15.69	1.07	12	1.00	14.00	1.11	8	0.88	2.50
12	⊳	0.40	13.20	17.00	19.00	17.94	1.13	12	1.00	16.25	1.17	8	0.88	2.50
14	R	0.42	15.30	18.75	21.00	20.31	1.19	12	1.13	18.75	1.19	10	0.88	3.50
16	EQ	0.43	17.40	21.25	23.50	22.56	1.25	16	1.13	21.00	1.26	12	0.88	3.50
18		0.44	19.50	22.75	25.00	24.83	1.37	16	1.25	23.25	1.32	12	0.88	3.50
20	θ	0.45	21.60	25.00	27.50	27.08	1.50	20	1.25	25.50	1.38	14	0.88	3.50
24		0.47	25.80	29.50	32.00	31.58	1.69	20	1.38	30.00	1.50	16	0.88	3.50
30		0.51	32.00	36.00	38.75	39.12	1.87	28	1.38	36.88	1.69	20	1.13	4.00
36		0.58	38.30	42.75	46.00	46.00	2.13	32	1.63	43.75	1.88	24	1.13	4.00
42		0.65	44.50	49.50	53.00	53.12	2.37	36	1.63	50.62	1.88	28	1.38	4.00
48		0.72	50.80	56.00	59.50	60.00	2.50	44	1.63	57.50	1.88	32	1.38	4.00

**FLG X FLG** 



- Tolerance on length of FLG x FLG and FLG x MJ pipe shall be +/- .125".
- Tolerance on length of FLG x PE shall be +/- .0625".
- Above material shall meet all applicable sections of ANSI A21.10, A21.15, A21.50, A21.51, B2.1, B16.1 / AWWA C110, C115, C150, C151 and all revisions thereto.
- Flanged pipe shall be Ductile iron pipe with Ductile iron flanges threaded on.
- Flange pipe is provided with cement lining per ANSI/AWWA A21.4/C104. Consult Sales Representative if other linings are required.
- The mechanical joint bell for 30" and 36" sizes of Ductile iron pipe have thicknesses different from those shown in ANSI A21.11, which are based on grey iron pipe. The reduced thickness provided a lighter-weight bell, which is compatible with the wall thickness of Ductile iron pipe.

FLG X MJ



- Submitted material only. Consult Engineer for application.
- 250 lb. faced and drilled flanges available upon request.
- CL53 Minimum Wall Thickness for all Fabricated Products.
- Grooved pipe to meet ANSI/AWWA C606 also available, consult Sales Representative for details.

FLG X PE

**PAGF 47** 



**FLANGE DETAIL** 



Additional configurations for joint connections are available. Contact a McWane Ductile Sales Representative for details.



## **SPECIFICATIONS FOR "STANDARD" FLANGE**

**PAGF 48** 

## NON-ASBESTOS & SBR RED RUBBER BOLT & GASKET SETS

#### **GENERAL CERTIFICATION:**

Sunpack of Pensacola, Inc. flange accessores, insulation kits and their components are designed and produced according to all applicable AWWA, ASTM, and ANSI standards and their latest revisions.

#### **GASKET MATERIAL:**

**Teadit 1001 Non-Asbestos** - steam sheet cut 1/16" and 1/8". Synthetic fiber with Nitrile Binder.

Temperature Limits	Maximum	750°F (400°C)
s	Continuous Max	460°F (240°C)
Pressure Limits	Maximum	1595 psi (110 bar)
	Continuous Max	725 psi (50 bar)
ASTM Line Call Out F104	F712120E22M5	

**SBR Red Rubber Style #20** – Sheet cut 1/16", 1/8" and ¼". In accordance to ASTM D-1330-66 Class 11 ASTM D-2000 type AA. Biltrite Product

Temperature Limits	Maximum	170 F
	Minimum	-20 F
Durometer Hardness Shore	A +/- 5: 75	
Tensile 400	Elongation 150	CONSOLIDATED PIPE & SUPPLY CO. INC. 1500 COUNTY HOSPITAL RD NASHVILLE TN 37218
How Dolto 9. Nuto		

Hex Bolts & Nuts

ASTM A307a Grade 2 Plain Hex Bolts

A563 Finished Hex Nuts on 150# Sets – A563 Heavy Hex Nuts on 300# Sets

E PAGE 49 5592AB Lead Free Brass Full Port Ball Valve

#### Feature

150# WSP / 600# WOG Lead free brass body Full port Adjustable packing FNPT x FNPT Threaded ends (ASME B1.20.1-NPT) Blow-out proof stem Virgin PTFE seats MSS-SP-110 CSA  $\frac{1}{2}$ , 5 & 125 psi ( $\frac{1}{4}$ " - 2") CSA  $\frac{1}{2}$  psi ( $2\frac{1}{2}$ " & 3") CSA  $\Delta$ C ( $\frac{1}{4}$ " - 2") UL approved ( $\frac{1}{4}$ " - 2") AB1953, NSF/ANSI 61 & 372 certified



Pressure/ Temperature rating 600 psi from 15 °F to 160 °F 150 psi max. at 366 °F

#### Material

	Part	Material	Specification
1	Body	Lead Free Brass	ASTM B927 C27450
2	End piece	Lead Free Brass	ASTM B927 C27450
3	Ball	Lead Free Brass / Cr plated	ASTM B927 C27450
4	Seat	PTFE	PTFE
5	Stem	Lead Free Brass	ASTM B927 C27450
6	O-ring	FKM	NSF approved
7	Packing nut	PTFE	PTFE
8	Packing nut	Brass	ASTM B124 C37700
9	Handle	Steel / Dacromet <sup>®</sup> plated	A36
10	Handle nut	Steel / Zn plated	A36



#### CONSOLIDATED PIPE & SUPPLY CO. INC. 1500 COUNTY HOSPITAL RD NASHVILLE TN 37218







#### Dimension, Cv, Weight

redwhitevalvecorp.com

	Φ	Α	С	Н	L	Р	Cv	Wt.
		[in]	[in]	[in]	[in]	[in]		[lb]
1⁄4"	1⁄4 - 18 NPT	1.77	0.45	1.54	3.19	0.39	8	0.26
<sup>3</sup> /8"	3∕8 - 18 NPT	1.77	0.45	1.54	3.19	0.39	8	0.28
1/2"	½ - 14 NPT	2.17	0.61	1.93	3.58	0.50	11	0.40
3/4"	¾ - 14 NPT	2.40	0.63	2.05	3.58	0.73	26	0.56
1"	1 - 11.5 NPT	2.91	0.75	2.36	4.96	0.95	55	0.98
11⁄4"	1¼ - 11.5 NPT	3.31	0.77	2.60	4.96	1.22	103	1.34
<b>1½</b> "	1½ - 11.5 NPT	3.54	0.77	2.87	5.55	1.46	111	1.88
2"	2 - 11.5 NPT	4.09	0.79	3.25	5.55	1.95	353	2.96
<b>2</b> <sup>1</sup> / <sub>2</sub> "	<b>2</b> ½ - 8 NPT	5.31	1.06	4.17	7.91	2.44	409	6.08
3"	3 - 8 NPT	6.02	1.14	4.53	11.06	2.91	530	8.94
4"	4 - 8 NPT	6.89	1.20	5.00	11.06	3.54	972	12.82



WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Drawings, photos and data are provided for information only and subject to change without notice. No part of this document and the produced, copied, modified or adapted, without the prior written consent of the copyright owner, unless otherwise indicated. The Drinking Mater At has defined lead free as having the average wetted surface ratio of the fixture to contain less than .25% of lead per volume.

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# Superior Accuracy. Zero Maintenance.

Neptune<sup>®</sup> MACH 10<sup>®</sup> Ultrasonic Meter



The MACH 10<sup>®</sup> ultrasonic water meter features solid state ultrasonic technology including a factorycalibrated, replaceable unitized measuring element (UME) with no degradation of accuracy over time. Combined with a corrosion-resistant, lead free, high-copper alloy maincase, the MACH 10 is built to withstand demanding service conditions and deliver sustained accuracy over the life of the meter.

- Sizes 3" through 12"
- Extended low-flow range for superior leak detection
- Accuracy sustained over meter life
- Can be installed in both horizontal and vertical applications
- Open flow path design with low pressure loss

- Advanced ultrasonic technology with easily replaceable UME design
- Lead free, high-copper alloy maincase
- UL Listed and FM Approved (standard)
- Available in standard turbine and compound lay lengths
- No maintenance



## **Specifications**

AWWA C715 Compliant

**NSF/ANSI 61 Certified** 

- UL Listed/FM Approved (Standard)
- **Maximum Operating Water Pressure**

• 175 psi

- **Operating Water Temperature Range**
- $+33^{\circ}F$  to  $+122^{\circ}F$  ( $+0.5^{\circ}C$  to  $+50^{\circ}C$ )

#### **Environmental Conditions**

- Operating temperature: +14°F to +149°F (-10°C to +65°C)
- Storage temperature: -40°F to +158°F (-40°C to +70°C)

#### **Expected Battery Life**

• 10 years

## **Applications**

- Potable water
- Fire service
- Reclaim water

#### Warranty

• Neptune provides a limited warranty for performance, materials, and workmanship. See warranty statement for details.

## System Compatibility

 Compatible with Neptune R900<sup>®</sup> System. Also available as MACH 10<sup>®</sup>)R900i<sup>™</sup> for an integrated radio solution and MACH 10<sup>®</sup>)TC for Sensus Touch Coupler compatibility.

## **Pressure Loss**

This chart shows typical meter performance. Individual results may vary.



Flow Rate (U.S. gpm)

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## **Operating Characteristics**

Motor	Extended Low	Normal Operating	Safe Maximum Operating Capacity				
Size	Accuracy (+/- 3.0%)	Range @ 100% Accuracy (+/- 1.5%)	Normal Operation (Non Fire Service)	Fire Service			
3″	0.50 U.S. gpm	0.75 to 500 U.S. gpm	500 U.S. gpm	420 U.S. gpm			
4"	0.75 U.S. gpm	1.5 to 1250 U.S. gpm	1250 U.S. gpm	1100 U.S. gpm			
6"	1.0 U.S. gpm	2.0 to 2000 U.S. gpm	2000 U.S. gpm	1800 U.S. gpm			
8″	4.0 U.S. gpm	6.0 to 4000 U.S. gpm	4000 U.S. gpm	4000 U.S. gpm			
10"	6.0 U.S. gpm	10.0 to 6500 U.S. gpm	6500 U.S. gpm	6500 U.S. gpm			
12″	8.0 U.S. gpm	12.0 to 8000 U.S. gpm	8000 U.S. gpm	8000 U.S. gpm			

## Registration

High (8-diរូ	3"	4"	6" - 12"	
1	U.S. Gallons	$\checkmark$	$\checkmark$	
10	U.S. Gallons			$\checkmark$
0.1	Cubic Feet	√	$\checkmark$	
1	Cubic Feet			$\checkmark$
0.01	Cubic Metres	$\checkmark$	$\checkmark$	
0.1	Cubic Metres			$\checkmark$

# LCD Display

9-digit display for extra resolution on manual reads.

Forward Flow + Warning for Excessive Flow



# Dimensions

Meter Size	Length	Height	Weight
<b>ר</b> אינ	12″	91⁄2″	39 lbs
5	17″	91⁄2″	42 lbs
A!!	14″	11″	51 lbs
4	20"	11″	57 lbs
<i>с</i> "	18″	12¾″	79 lbs
0	24″	12¾″	91 lbs
8"	20"	15 ⅔"	160 lbs
10"	26"	<b>17</b> %10"	264 lbs
12"	<b>19</b> 7⁄10"	20"	292 lbs

## Available Units of Measure

Consumption	Rate
Gallons	GPM
Cubic Feet	GPM
Cubic Metres	LPM



Unitized Measuring Element (UME)



Neptune Technology Group 1600 Alabama Highway 229 Tallassee, AL 36078 800-633-8754 f 334-283-7293

# Critical Communication and Easy Migration

Neptune<sup>®</sup> R900<sup>®</sup> System Endpoints



Neptune's R900<sup>®</sup> System endpoints greatly improve access to meter readings while delivering accurate, detailed, and timely consumption information to proactively identify and resolve high bill complaints, reduce delinquent payments, and eliminate write-offs to maximize revenue. The user-friendly, intuitive endpoint design simplifies the installation process and increases operational efficiency.

Neptune R900 wall and pit endpoints provide continuous transmission of meter data and the flexibility of mobile or fixed network reading methods. Migrate easily to AMI when you're ready without separate reading systems, site visits, or endpoint reconfiguration.

- Improve meter reading efficiency with robust walk-by, mobile, and fixed network connectivity
- Build on to existing technology investments with forward and backward compatible endpoints
- Improve quality of service and billing accuracy with detailed consumption data

- Fast installation and no programming required
- Works seamlessly with existing assets and future enhancements
- Pinpoint trouble areas quickly with flags that identify leaks, reverse flow, and tampering
- Peace of mind with access to 96 days of stored history



## **Technical Specifications**

#### **Electrical Specifications**

• Endpoint power: Lithium battery with capacitor

#### Transmitter Specifications

- Two-way endpoint
- Transmit period (interleaved mobile and fixed network messages):
- Standard mobile message every 14 seconds at 100 mW
- Standard fixed network message every 7½ minutes at 1 Watt
- FCC verification: Part 15.247
- Transmitter channels: 50; frequency-hopping, spread-spectrum
- Frequency range: 910 to 920 MHz
- Encoder register reading interval:
- ° Every 15 minutes
- Data logging interval:
  - ° 96 days of hourly data

#### **Environmental Conditions**

- Operating temperature: -22°F to +149°F (-30°C to +65°C)
- Storage temperature: -40°F to +158°F (-40°C to +70°C)
- Operating humidity: 100% condensing

#### Antennas

- Wall endpoint: standard internal antenna
- Pit endpoint: standard throughthe-lid antenna
- 18" Coax
- ∘ 6' Coax
- <mark>20' Coax</mark>

#### Encoded Register Compatibility

- Neptune ARB<sup>®</sup> V, ProRead<sup>™</sup>, ProCoder<sup>™</sup>, and E-CODER<sup>®</sup>
- Sensus ECR II, ICE, iPerl, Electronic Register and OMNI
- Hersey/Mueller Translator
- Badger ADE and HR E|LCD
- Elster/AMCO InVision (Sensus protocol version)

#### **Options**

#### System Compatibility

- Handhelds with R900<sup>®</sup> belt clip transceiver mobile RF
- R900 mobile data collector mobile RF
- R900 gateways fixed network RF

#### Warranty

• Neptune provides a limited warranty for performance, materials, and workmanship. See warranty statement for details.

## **Dimensions**





#### R900 Wall Endpoint



R900 Pit Endpoint



R900 Pit Antenna



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#### **#winyourday** neptunetg.com

## Neptune Technology Group

1600 Alabama Highway 229 Tallassee, AL 36078 800-633-8754 f 334-283-7293



# Source for Neptune<sup>(1)</sup> MACH-10, ProCoder, and E-CODER Water Meters!

SCADAmetrics<sup>®</sup> is pleased to introduce the newest member of its DINstrumentation<sup>™</sup> series – **The Signalizer<sup>™</sup>!** 

This new electronic signal generator for water meters provides a 4-20 milliamp (flow) output and a dry contact pulse (per volume) output! – while still maintaining the meter's ability to be co-connected to an AMI/AMR endpoint!

Meter Owners have traditionally been required to make a weighted buying decision: encoder-type meter?... or milliamp/pulse-type meter? **The Signalizer** allows you to easily have <u>both</u> with the same meter!

**The Signalizer** utilizes the popular encoder signal from the water meter to generate both a 4-20mA rate-of-flow signal<sup>1</sup> and a dry-contact pulse-per-volume signal. ...And because **The Signalizer** is outfitted with an integral pass-thru port, it can co-exist with an AMI/AMR system<sup>(2)</sup>. Even if power is removed, the pass-thru port is always functional – ensuring continuous connectivity to the AMR/AMI system!

**The Signalizer** is compatible with the Neptune PROCODER, E-CODER, and MACH- $10^{(3)}$  registers.

<sup>(1)</sup>Encoder Resolution – a high-fidelity 4-20mA signal requires high-resolution encoder resolution (8+ digits). Therefore, for optimal SIGNALIZER performance, we recommend the MACH-10, PROCODER or E-CODER register. When the SIGNALIZER is utilized with a ProRead register, it will only produce a pulse output signal. The SIGNALIZER is NOT compatible with the R900i (integrated radio) versions of these registers.

<sup>(2)</sup>**Permitting** – If the meter is owned by the water utility, we recommend that you first contact its engineering department for permission!

(3)MACH-10 Reaction Time – In order to preserve the battery life of the MACH-10, the sample period of the Signalizer should be set to 300+ seconds, resulting in a signal reaction delay of up to 300s for both the 4-20mA and pulse signals. If a more "realtime" signal is required, then a mechanical meter with PROCODER or E-CODER register should be used.

#### Key Features -

• 4-20mA Flow-Proportional Output (3KV Isolation).

METER

- Dry-Contact, Volume-Proportional Output (3.75KV Isolation).
- Dry-Contact Alarm Output (3.75KV Isolation).
- Built-In Pass-Thru Port for Co-Connection to an AMI/AMR System Works Even If Power Down!

**PAGE 54** 

- Compatible with MACH-10, PROCODER, and E-CODER registers.
- Works with All Popular Registration Units (Gallons, Cubic Feet, Cubic Meters, Acre Feet).
- No Computer Required! Setup via DIP Switches Only!
- Removable Terminal Blocks, Simplified Wiring Procedures.
- Mounts on standard 35mm industrial DIN-rail.
- 24VDC-Powered (1.5KV Isolation). Low 1.2W Power Consumption.
- Enclosure and Circuit Board: UL 94-VO recognized materials.
- Simulation-Mode Feature: Emits 12mA and 1 Hz Pulse.

Are you interested in how SCADAmetrics meter technology can help you more closely monitor the flow through your water meters? Give us a call! We'll be glad to discuss the details!

> SCADAmetrics scadametrics.com Wildwood, Missouri USA 636.405.7101


#### **Engineering Specifications -**

Dimensions:	4.5" x 5.0" x 1.275"
Weight:	6.5 Ounces
Supply Voltage:	9-36V <sub>DC</sub>
Supply Power:	1.25W
Power Supply Isolation:	1500V <sub>RMS</sub>
Neptune Protocol Support: Sensus Protocol Support: Elster Protocol Support: AMI Pass-Thru Port Support:	Yes, 8,9-Digit "MACH-10/ProCoder/E-CODER", and 6-Digit "ProRead" Protocols Yes, Both Fixed and Variable Digit Sensus Protocols (4-9 digits) Yes, Auto-Fills Units and Decimal Shift, Based on Embedded Info within Elster K-Frame Universal – Works with All Major-Brand AMI/AMR Endpoints: Neptune, Sensus, Aclara, Badger, Metron-Farnier, Itron, Master Meter, Hersey/Mueller, RG3, Zenner, Honeywell, Kamstrup, SCADAmetrics, Touchpads (All), Remote Displays (All)
Supported Units:	Gallon, Cubic Feet, Cubic Meters, Acre-Feet
Supported Scalors:	x1 , x10 , x100 , x1,000 x0.1 , x0.01 , x0.001 , x0.0001 , x0.00001
Encoder Sample Period (s):	5, 10, 15, 30, 60, 300, 600, 900 (User-Selectable)
Programming Method:	Integrated DIP Switches, 16-Poles
4-20mA Flow Range (gpm): 4-20mA Flow Range (lpm): 4-20mA Resolution: 4-20mA Isolation: 4-20mA Max Series Resistance: 4-20mA Signal Type:	$\begin{array}{l} 20,30,50,80,125,200,300,500,750,1200,2000,3000,4600,7300,11400,18000\\ 75,120,200,300,475,750,1200,2000,3000,4500,7000,11000,17500,27500,43000,68000\\ 16-Bit DAC\\ 3000V_{\text{RMS}}\\ 500\ \Omega\\ \text{Active. Therefore, } \underline{do\ not} \ add\ an\ external\ loop\ supply,\ or\ else\ damage\ to\ the\ unit\ will\ result!} \end{array}$
Pulse Output Type: Contact Closure Duration: Alarm Output Type: Pulse Resolution: Closed-Contact Resistance: Closed-Contact Max Current: Open-Contact Max Voltage: Pulse/Alarm Isolation:	Solid-State Dry-Contact, 1 Pulse-per-Encoder Resolution 50% Duty Cycle or 1000ms – whichever is less Solid-State Dry-Contact, Closes if Meter or Signalizer Fault Normal-Speed Mode: Pulse Resolution = Encoder Resolution Low-Speed Mode: Pulse Resolution = Encoder Resolution / 10 0.4 ohm, typical 500mA 60V 3750V <sub>RMS</sub>
Meter Cable Connection:	3-Position, Removable Screw-Down Terminal Block, 12-26 AWG
Pass-Thru Cable Connection:	3-Position, Removable Screw-Down Terminal Block, 12-26 AWG
Pass-Thru Port for AMR/AMI:	Yes, Supports both 3-Wire and 2-Wire AMR Devices
Temperature:	-40C to 85C (-40°F to 185°F)
Relative Humidity:	5% to 95%, Non-Condensing
Enclosure Rating:	Built to IP40 Specifications, Not Rated for Submersion/Outdoor Use
Manufacturing Location:	USA
Environmental:	ROHS-Compliant, Lead-Free
Meter Interface:	AWWA C707-05
Warranty:	2 Years (see www.scadametrics.com for details)

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#### **Engineering Dimensions (Inches) -**



#### Meter Terminal Block Hookup -

Term.	Function	Neptune Meter With Standard Cable	Neptune Meter with Nicor Cable	Neptune Meter with Itron ERT Cable
1	Meter Clock	Black	Red	Black
2	Meter Data	Red	Green White	Red
3	Meter Ground	Green	Black	White Shield

#### AMR/AMI Terminal Block Hookup -

Term.	Function	Neptune MIU with Standard Cable	Neptune (or other) MIU with Nicor Cable	Neptune (or other) MIU with Itron ERT Cable	Sensus, Badger, Mueller, Master-Meter, Metron-Farnier, Zenner, RG3, Kamstrup MIU	Elster AMCO MIU
4	AMI Clock	Black	Red	Black	Red	White Green
5	AMI Data	Red	Green White	Red	Green White	Red
6	AMI Ground	Green	Black	White Shield	Black	Black

Wiring Notes:

- 1. <u>Meter</u> Terminal Block Hookup (Terminals 1,2,3): Apply the color-coding that pertains to the manufacturer of the Water Meter (or manufacturer of the Specialty Cable, such as Nicor or Itron).
- 2. <u>Utility AMI/AMR</u> Terminal Block Hookup (Terminals 4,5,6): Apply the color-coding that pertains to the manufacturer of the AMI/AMR Endpoint (or manufacturer of the Specialty Cable, such as Nicor or Itron).

#### Signal Terminal Block Hookup -

Terminal	Function	Notes
7	4-20mA +	Sattable Dange via DID Switches
8	4-20mA –	Settable Range via DIP Switches
9	Pulse +	Solid-State Dry Contact (N-O)
10	Pulse –	500mA Max, 60V Max
11	Alarm +	Solid-State Dry Contact (N-O)
12	Alarm –	500mA Max, 60V Max

#### DIP Switch Setup (Also Imprinted on Device Rear Cover) -



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### **QUICK-START GUIDE -**



#### WIRING FOR:

NEPTUNE MACH-10, PROCODER, E-CODER, & WATERFLUX 3070 Fig1

#### **Initial Setup:**

- **1.** Attach the water meter's three (3) encoder wires to Signalizer terminals 1,2,3 (see above table for color-coding).
- 2. (If Applicable) Attach the AMR/AMI endpoint's three (3) encoder wires to Signalizer terminals 4,5,6 (see above table for color-coding).
- 3. (If Applicable) Connect the 4-20mA output signal to PLC/Controller: Terminals 7(+) and 8(-). Important Note! – The Signalizer<sup>™</sup> provides loop power. The user <u>must not</u> add an additional loop power supply, or else damage to the unit will result.
- 4. (If Applicable) Connect the pulse output signal to the PLC/Controller: Terminals 9 and 10. Important Note! – The pulse output is a solidstate, dry-contact type. 500mA max, 60V max. Circuit must be current-limited by external means.
- 5. (If Applicable) Connect the alarm output signal to the PLC/Controller: Important Note! The alarm output is a solid-state, dry-contact type. 500mA max, 60V max. Circuit must be current-limited by external means.
- 6. Set the DIP Switches, per the Datasheet.
- 7. Connect DC voltage source to the Signalizer's V+/V- terminals. An isolated  $24V_{DC}$  power supply is recommended.

#### Apply Power, and Observe...

- The Upper Yellow 'Hearbeat' LED should light up YELLOW, with an OCCASIONAL BLINK, signifying that the Signalizer is working.
- The Upper Green 'Meter OK' LED should light up SOLID GREEN, signifying that the meter has been successfully detected.
- The Lower Yellow LED will follow the Pulse Output (LED ON=Contact Closure).
- $_{\odot}$  The Lower Green LED will light up SOLID GREEN during periods when Positive Flow is Detected.

#### **NEPTUNE WATER METERS** – PERSONALITY SETTINGS FOR NEPTUNE WATER METERS.

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#### Recommended DIP Switches 1-12, Settings for MACH-10:

Size	Gallon	Cubic Feet	Cubic Meters	
				-
5/8,3/4,1	DipSw.1=ON	DipSw 2=	DipSw.1=ON	
	DipSw 3=	DipSw.2= DipSw.3=ON	DipSw.2=	
	DipSw.4=	DipSw.4=	DipSw.4=ON	
		-	-	
	DipSw.5=ON	DipSw.5=ON	DipSw.5=ON	
	DipSw.6=	DipSw.6=	DipSw.6=	
	DipSw.7=ON	DipSw.7=ON	DipSw.7=ON	
	DipSw.8=	DipSw.8=	DipSw.8=	
	DinSw 9=	DinSw 9=0N	DinSw 9=	
	DipSw.10=	DipSw.10=	DipSw.10=ON	
	DipSw.11=ON	DipSw.11=ON	DipSw.11=ON	
	DipSw.12=	DipSw.12=	DipSw.12=	C WO
	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	
	1 Puise / 0.1 Gai	1 Puise / 0.01 P1°	I Pulse / 0.001 M <sup>o</sup>	
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	A CONTRACTORY AND A
	1 Pulse / 1 Gal	1 Pulse / 0.1 FT <sup>3</sup>	1 Pulse / 0.01 M <sup>3</sup>	Attest In
1 5" 2" 3" 4"	DipSw.1=ON	DipSw.1=ON	DipSw.1=ON	
1.5 / 2 / 5 / 4	DipSw.2=	DipSw.2=	DipSw.2=	
	DipSw.3=	DipSw.3=ON	DipSw.3=	MACH 10
	DipSw.4=	DipSw.4=	DipSw.4=ON	
		DisSur E-ON		<b>A</b>
	DipSw.5=UN	DipSw.5=UN	DinSw 6=	
	DipSw.0-	DipSw 7=0N	DipSw.0-	
	DipSw.8=	DipSw.8=	DipSw.8=	
	DipSw.9=	DipSw.9=	DipSw.9=ON	
	DipSw.10=	DipSw.10=	DipSw.10=	
	DipSw.11=	DipSw.11=ON	DipSw.11=ON	
	DipSw.12=	DipSw.12=	DipSw.12=	
	Normal Speed Pulse	Normal Speed Pulse	Normal Sneed Pulse:	
	1 Pulse / 1 Gal	1 Pulse / 0.1 FT <sup>3</sup>	1 Pulse / 0.01 M <sup>3</sup>	
				MACH 10 Departion
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	MACH-IU REACTION
	1 Pulse / 10 Gal	1 Pulse / 1 FT <sup>3</sup>	1 Pulse / 0.1 M <sup>3</sup>	Time
6"-12"	DipSw.1=ON DipSw.2=	DipSw.1=ON	DipSw.1=ON	line line
	DipSw.2=	DipSw 3=ON	DipSw.2=	
	DipSw.4=	DipSw.4=	DipSw.4=ON	
	-	-	-	In order to preserve the battery life
	DipSw.5=ON	DipSw.5=ON	DipSw.5=ON	of the MACH-10, the sample period
	DipSw.6=	DipSw.6=	DipSw.6=	of the Cigneliner should be get to
	DipSw.7=ON	DipSw.7=ON	DipSw.7=ON	of the Signalizer should be set to
	DIp3w.8-	DIp3w.8=	DipSw.8=	300+ seconds, resulting in a signal
	DipSw.9=ON	DipSw.9=	DipSw.9=	reaction delay of up to 300s for
	DipSw.10=	DipSw.10=	DipSw.10=	both the 4-20mA and pulse signals.
	DipSw.11=	DipSw.11=	DipSw.11=ON	
	DipSw.12=	DipSw.12=	DipSw.12=	If a more "realtime" signal is
	Normal Speed Bulcou	Normal Speed Bulco:	Normal Speed Bulco	required then a machanical meter
	1 Pulse / 10 Gal	1 Pulse / 1 FT <sup>3</sup>	1 Pulse / 0.1 M <sup>3</sup>	with ppocop5p or 5 cop5p
				WITH PROCODER OF E-CODER
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	register should be used.
	1 Pulse / 100 Gal	1 Pulse / 10 FT <sup>3</sup>	1 Pulse / 1 M <sup>3</sup>	4
16″	DipSw.1=ON	DipSw.1=ON	DipSw.1=ON	
	DipSw.2=	DipSw.2=	DipSw.2=	
	DipSw.3= DipSw.4=	DipSw.3=ON DipSw.4=	DipSw.3= DipSw 4=0N	
	Dipomit-	Dipottit-	Bipomi-on	
	DipSw.5=ON	DipSw.5=ON	DipSw.5=ON	
	DipSw.6=	DipSw.6=	DipSw.6=	
	DipSw.7=ON	DipSw.7=ON	DipSw.7=ON	
	DipSw.8=	DIpSw.8=	DIpSw.8=	
	DinSw 9=	DinSw 9=0N	DinSw 9=	
	DipSw.10=ON	DipSw.10=	DipSw.10=	
	DipSw.11=	DipSw.11=	DipSw.11=	
	DipSw.12=	DipSw.12=	DipSw.12=	
	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	
	1 Puise / 100 Gal	1 Puise / 10 FT <sup>3</sup>	1 Puise / 1 M <sup>3</sup>	
	Low Speed Pulse	Low Speed Pulse	Low Speed Pulse	
	1 Pulse / 1000 Gal	1 Pulse / 100 FT <sup>3</sup>	1 Pulse / 10 M <sup>3</sup>	

#### **NEPTUNE WATER METERS –** PERSONALITY SETTINGS FOR NEPTUNE WATER METERS.

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#### Recommended DIP Switches 1-12 for **<u>ProCoder</u>**, and **<u>E-CODER</u>** Registers:

Size	Caller	Cubic East	Cubic Motors	
Size	Gallon	Cubic Feet		
5/8", 3/4", 1"	DipSw.1=ON	DipSw.1=ON	DipSw.1=ON	
	DipSw.2=	DipSw.2=	DipSw.2=	
	DipSw.3=	DipSw.3=ON	DipSw.3=	
	DipSw.4=	DipSw.4=	DipSw.4=ON	
	DipSw.5=	DipSw.5=	DipSw.5=	
	DipSw.6=ON	DipSw.6=ON	DipSw.6=ON	
	DipSw.7=	DipSw.7=	DipSw.7=	12 1111 C
	DipSw.8=	DipSw.8=	DipSw.8=	
	-	-		
	DipSw.9=	DipSw.9=ON	DipSw.9=	
	DipSw.10=	DipSw.10=	DipSw.10=ON	
	DipSw.11=ON	DipSw.11=ON	DipSw.11=ON	
	DipSw.12=	DipSw.12=	DipSw.12=	
	•	•	DD	
	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	OCODER
	1 Pulse / 0.1 Gal	1 Pulse / 0.01 FT <sup>3</sup>	1 Pulse / 0.001 M <sup>3</sup>	
		-		
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	ECODED
	1 Pulse / 1 Gal	1 Pulse / 0.1 FT <sup>3</sup>	1 Pulse / 0.01 M <sup>3</sup>	LCODER
1 5" 2" 2" 4"	DipSw.1=ON	DipSw.1=ON	DinSw.1=ON	Special Case! -
1.5,2,5,4	DinSw 2=	DinSw 2=	DinSw 2=	For 1 5" T-10 with E-Coder
	DipSw 3=	DipSw 3=ON	DipSw 3=	
	DipSw 4=	DipSw 4=	DipSw 4=ON	DinSw 1=ON
	Dip3W.4=	Dip3W.4=	Dipow.4-ON	DipSw 2=
	DinSw E-	DinSw E-	DipSw E-	DipSw 3-
	DipSw.5-	DipSw.5-	DipSw.6-ON	DipSw 4-ON
		DinSw 7-	DipSw 7-	
	DipSw 8-	DipSw.7 –	DipSw 8-	DinSw 5=
	Dipow.o-	51950.0-	519500-	DipSw 6=ON
	Di-C 0	Di-C 0	Discus 0 - ON	
	DipSw.9=	DipSw.9=	DipSw.9=ON	DipSw.7=
	DipSw.10=	DipSw.10=	DipSw.10=	DipSw.8=
	DipSW.11=	DipSw.11=ON	DipSw.11=UN	Di-C 0-
	DipSw.12=	DipSw.12=	DipSw.12=	
	Newsol Conserved Dealers	Normal Crossed Datase	Namual Crossed Bulance	DIPSW.10=ON
	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	DIPSW.11=ON
	1 Puise / 1 Gai	1 Pulse / 0.1 FT	1 Pulse / 0.01 M <sup>3</sup>	DipSw.12=
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	Normal Speed Pulse:
	1 Pulse / 10 Gal	1 Pulse / 1 FT <sup>3</sup>	1 Pulse / 0.1 M <sup>3</sup>	1 Pulse / 0.001 M <sup>3</sup>
				Low Speed Pulse:
	-	-	-	1 Pulse / 0.01 M <sup>3</sup>
6"-12"	DipSw.1=ON	DipSw.1=ON	DipSw.1=ON	
	DipSw.2=	DipSw.2=	DipSw.2=	
	DipSw.3=	DipSw.3=ON	DipSw.3=	
	DipSw.4=	DipSw.4=	DipSw.4=ON	
	_	_		
	DipSw.5=	DipSw.5=	DipSw.5=	
	DipSw.6=ON	DipSw.6=ON	DipSw.6=ON	
	DipSw.7=	DipSw.7=	DipSw.7=	
	DipSw.8=	DipSw.8=	DipSw.8=	
	DipSw.9=ON	DipSw.9=	DipSw.9=	
	DipSw.10=	DipSw.10=	DipSw.10=	
	DipSw.11=	DipSw.11=	DipSw.11=ON	
	DipSw.12=	DipSw.12=	DipSw.12=	
	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	
	1 Pulse / 10 Gal	1 Pulse / 1 FT <sup>3</sup>	1 Pulse / 0.1 M <sup>3</sup>	
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	
	1 Pulse / 100 Gal	1 Pulse / 10 FT <sup>3</sup>	1 Pulse / 1 M <sup>3</sup>	
16″	DipSw.1=ON	DipSw.1=ON	DipSw.1=ON	
	DipSw.2=	DipSw.2=	DipSw.2=	
	DipSw.3=	DipSw.3=ON	DipSw.3=	
	DipSw.4=	DipSw.4=	DipSw.4=ON	
	DipSw.5=	DipSw.5=	DipSw.5=	
	DipSw.6=ON	DipSw.6=ON	DipSw.6=ON	
	DipSw.7=	DipSw.7=	DipSw.7=	
	DipSw.8=	DipSw.8=	DipSw.8=	
	DipSw.9=	DipSw.9=ON	DipSw.9=	
	DipSw.10=ON	DipSw.10=	DipSw.10=	
	DipSw.11=	DipSw.11=	DipSw.11=	
	DipSw.12=	DipSw.12=	DipSw.12=	
1		1	1	
	Normal Speed Pulse:	Normal Speed Pulse:	Normal Speed Pulse:	
	1 Pulse / 100 Gal	1 Pulse / 10 FT <sup>3</sup>	1 Pulse / 1 M <sup>3</sup>	
			1	
	Low Speed Pulse:	Low Speed Pulse:	Low Speed Pulse:	
	1 Pulse / 1000 Gal	1 Pulse / 100 FT <sup>3</sup>	1 Pulse / 10 M <sup>3</sup>	

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#### **NEPTUNE WATER METERS** – PERSONALITY SETTINGS FOR NEPTUNE WATER METERS (CONT).

Recommended DIP Switches 13-16 for <u>MACH-10</u>, <u>ProCoder</u>, <u>E-CODER</u>, and <u>WaterFlux 3070</u> Registers:

The Following \*Suggested\* Flow Span Settings, and May Need To Be Adjusted Based on Anticipated Max Flow Conditions.

Size	Gallon , Cubic Feet , Cubic Meters
5/8" MACH-10, T10	DipSw.13=
-	DipSw.14=
20 gpm	DipSw.15=
75 lpm	DipSw.16=
3/4" MACH-10, T10	DipSw.13=ON
	DipSw.14=
30 gpm	DipSw.15=
120 lpm	DipSw.16=
1″ MACH-10, T10	DipSw.13=
	DipSw.14=ON
50 gpm	DipSw.15=
200 lpm	DipSw.16=
1.5" MACH-10, T10	DipSw.13=
	DipSw.14=
125 gpm	DipSw.15=ON
475 lpm	DipSw.16=
2" MACH-10, T10, 1.5-2" HPT	DipSw.13=ON
	DipSw.14=
200 gpm	DipSw.15=ON
750 lpm	DipSw.16=
3" MACH-10, HPT	DipSw.13=ON
500	DIPSW.14=ON
500 gpm	DipSw.15=ON
	DIPSW.16=
4" MACH-10, HPT	DIPSW.13=ON
1200 anm	
4500 Jpm	
	DipSw.10-ON
0 MACH-10, HPT	DipSw.13=ON DipSw.14=ON
3000 apm	DipSw 15-
11000 lpm	DipSw 16=0N
8" MACH-10 HPT	DipSw 13=
o mach io, m i	DipSw 14=
4600 apm	DipSw.15=ON
17500 lpm	DipSw.16=ON
10" MACH-10, HPT	DipSw.13=ON
	DipSw.14=
7300 apm	DipSw.15=ON
27500 lpm	DipSw.16=ON
12" MACH-10, HPT	DipSw.13=
,	DipSw.14=ON
11400 gpm	DipSw.15=ON
43000 lpm	DipSw.16=ON
16" MACH-10, HPT	DipSw.13=ON
	DipSw.14=ON
18000 gpm	DipSw.15=ON
68000 lpm	DipSw.16=ON

# NON-STANDARD SAMPLING TIMES -

#### • FAST-REACTION BATCHING METERS

(a) Fast-Reaction Batching Control Meters require ultra-fast reaction time (1 sec). Please ensure that the connected encoder-type flow meter can tolerate ultra-short sample periods (i.e. battery issues).

When the Internal Jumper<sup>(1)</sup> is installed onto the Signalizer Factory Header as illustrated below, then the interrogation sample timings are activated accordingly:

Signalizer Sample Period Setting (sec) DIP Switch Settings	Non-Standard Sample Period (sec)	
5	1	Use for Fast Batch Control
10	8	
15	16	Valid Settings
30	32	for
60	64	Flow-IQ 3200
300	128 (OK for Mach-10)	
600	640 (OK for Mach-10)	
900	960 (OK for Mach-10)	

Signalizer Sample Period Setting (sec) DIP Switch Settings	Non-Standard Sample Period (sec)	
5	1	0
10	2	se fo Fast 3atcl ontr
15	3	<u>o</u> <u>-</u> 9
30	32	
60	64	Alto Pe
300	128 (OK for MACH-10)	mp
600	640 (OK for MACH-10)	is le te
900	960 (OK for MACH-10)	

(1) Requires Setting of "Non-Standard Sampling Mode" Activation Jumper. User Must Open Device Case, and Set Shunt Jumper on Circuit Board Utility Header:



Activate Non-Standard

Sampling Mode



2 4 6 8 10 De-Activate Non-Standard Sampling Mode



# Jarrett Concrete Products615-792-93322012 Hwy 12 South, Ashland City, TN 37015

28 Day, 5,000 PSI Concrete #4 Rebar @ 12" O.C.E.W. Meets ATSM C923 & C990 Steps Centered to Hatch Heaviest Pick Weight: 11,365 lbs

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HALLIDAY PRODUCTS, INC. ORLANDO, FL http://www.hallidayproducts.com



MODEL NO. S1R041041C---D----QUANTITY: 1 DOCUMENT NO.: Q85403 DATE: 1/14/25 LOCATION/TAG: CITY OF MT. PLEASANT



#### STANDARD FEATURES:

1/4 ALUMINUM TREAD PLATE COVER 1/4 THICK ALUMINUM FRAME EXTRUSION T-316 STAINLESS STEEL HARDWARE S.STL. & ALUM. HOLD OPEN ARM RECESSED LIFT HANDLE LIFETIME GUARANTEE 300 LB. PER SQ. FT. LOAD RATING

#### **OPTIONS/FEATURES:**



# **201L LIQUID FILLED 201D Dry** LOWER MOUNT



Glycerine filled for added durability in applications where vibration or pulsation is present Stainless steel case and bezel, copper alloy internals

SPECIFICATIONS											
Dial $1 \frac{1}{2}$ (40 mm), 2' (50 mm), 2 $\frac{1}{2}$ (63 mm), 4" (100 mm)CaseStainless Steel, Glycerin Filled or DryWetted PartsCopper alloyBezelStainless steel, fixedLensPolycarbonatePointerBlack aluminumConnectionLower mount $1 \frac{1}{2}$ " dial = $\frac{1}{8}$ " NPT $2$ " dial = $\frac{1}{8}$ " or $\frac{1}{4}$ " NPT $2 \frac{1}{2}$ " dial = $\frac{1}{4}$ " or $\frac{1}{2}$ " NPTScaleStandard: psi/BAR (x 100 = kPa) Single scale psi available from stock								100 million and 100	50 50 50 50 50 50 50 50 50 50 50 50 50 5		
Accura	су		3-2-3% of span 1 ½" & 2" ASME B40.1 Grade B					AVAILABLE OP	TIONS*		
Ambien	<b>bient Temp</b> $2^{-1-2\%}$ of span 2 $\frac{7}{2}$ & 4 ASME B40.1 Grade A Glycerine Filled = 30° F to 160° F							auer	<ul> <li>Certificate of Ac</li> <li>Custom Dial</li> </ul>	ccuracy, NIST	traceable
Design meets or exceeds ASME B40.100 pressure gauge standard.						d.	Liquid Fill Optic	ons, see page	176		
	-					B			<ul> <li>Glass Lens</li> <li>Dry, Fillable Ca</li> <li>Cleaned for Ox</li> <li>Special Connect</li> <li>Protective Rubb</li> <li>Max/Min Pointe</li> <li>*Lead times/minin</li> <li>APPROXIMATE BOX QUANTITI</li> <li>Dial Size</li> <li>1 ½"</li> </ul>	se ygen Service ction Size per Cover, se er, see page 1 nums may ap SHIPPING V ES Est. Unit Weight 0.20 lbs	(dry only) e page 121 22 oply VEIGHTS/ Box Qty 100
	Dial	Unit	Α	В	С	D	E		0"	(0.10 kg)	100
	1 ½"	ln.	1.85"	1.00"	0.67"	2.28"	1∕₀" NPT		Ζ.	0.40 lbs (0.18 kg)	100
-		mm	47	25	17	58 2.05"			2 1⁄2"	0.55 lbs	50
	2"	mm	2.27 58	31	23	2.95 75	1⁄8" or 1⁄4" NPT		<mark>4"</mark>	1.5 lbs	30
		In.	2.80"	1.40"	1.07"	3.55"			_	(0.68 kg)	

1⁄4" NPT

1⁄4" or 1⁄2"

NPT

90

5.21"

132

2

mm

ln.

mm

71

4.29"

109

36

1.75"

45

27

1.17"

30

2 1/2"

4"

#### CONSOLIDATED PIPE & SUPPLY CE NG 7 1500 COUNTY HOSPITAI RIAGE 67 NASHVILLE TN 37218



# Tapping Sleeve All Stainless Steel



Description: All stainless steel tapping sleeve with 360° gasket seal and removable bolts. Application: For tapping size-on-size or reducing branch connections on new or existing pipe.

#### Key Features:

- Easy to install
- Range helps reduce inventory
- Meets applicable AWWA C223 Standards
- Molded-in ring in the gasket to ensure effective sealing
- Nylon washers to improve bolt torque capability
- Heavy gauge, all-Stainless Steel body for rugged performance
- Fully chemically passivated for maximum corrosion protection
- ¾" test outlet to allow hydrostatic pressure test before tapping the pipe
- 360° seal provides maximum support and reinforcement around the pipe in case of pipe break
- Body drawn out to accept the outlet neck adding to the overall strength of the area under the most stress

#### Materials Specifications (subject to change)

BODY: Full circumference band. 18-8 type 304 Stainless Steel

FLANGES: AWWA C228 Class SD, ANSI 150# drilling. Recessed for Tapping Valve Per MSS-SP 60. 18-8 type 304 Stainless Steel flange on 663. *Optional: Other types of Flanges, threaded outlets, MJ Outlets.* GASKET: Nitrile (Buna-N) NSF® 61 compounded to resist water, oil, acids, alkalies, most (aliphatic) hydrocarbon fluids and many chemicals Temperature Range: up to +180 BOLTS, NUTS & WASHERS: 18-8 Type 304 Stainless Steel heavy hex nuts, bolts & washers. Nuts and studs are coated to prevent galling

#### Working Pressure:

- 4" 12" nominal pipe size(s) = 150 psi / 225 psi
- 14" nominal pipe size = 140 psi / 210 psi
- 16" nominal pipe size = 125 psi / 187 psi
- 18" 20" nominal pipe size(s) = 100 psi / 150 psi
- 24" nominal pipe size = 75 psi / 112 psi

Pipe Applications: Carbon Steel, Stainless Steel, Cast Iron, Asbestos Cement, PVC, HDPE, Ductile Iron

Sizes (in inches): 4"-24" Nominal with 4"-12" Outlets

NOTE: See Specification Sheet for HDPE and PVC application details.



CONSOLIDATED PIPE & SUPPLY CO. INC 1500 COUNTY HOSPITAL RD NASHVILLE TN 37218



# **Tapping Sleeve**

Carbon and Stainless Steel Flange

#### Tapping Sleeve Specification

OUTLET SIZE	NOMINAL BODY SIZE	A (IN)	B (IN)	C (IN)	D (IN)	E (IN)	F (IN)
	4	15	5	5 1/16	4 1/4	8	5/8
4	6-18	15	5	5 1/16	4 1/4	8	5/8
	20-24	20	5	5 1/16	4 1/4	8	5/8
	6	15	5	7 1/16	6 5/16	8	5/8
6	8-18	15	5	7 1/16	6 5/16	8	5/8
	20-24	20	5	7 1/16	6 5/16	10	5/8
	8	20	5	9 1/16	8 5/16	10	5/8
8	10-18	20	5	9 1/16	8 5/16	10	5/8
	20-24	25	5	9 1/16	8 5/16	14	5/8
10	10	25	5	11 3/32	10 1/4	14	5/8
10	20-24	25	5	11 3/32	10 3/8	14	5/8
10	12	25	5	13 3/32	12 1/4	14	5/8
12	14-24	25	5	13 3/32	10 3/8	14	5/8



For MJ outlets, replace the last two 00s in the middle eight digits with MJ. Example: 664-127504MJ-000.

NOMINAL SIZE OF PIPE X FLANGED OUTLET	OD RANGE (INCHES)	664 FLEXI-COAT® EPOXY COATED CARBON STEEL FLANGE	665 STAINLESS STEEL FLANGE	APPROX. WEIGHT EACH POUNDS	
		CATALOG NUMBER	CATALOG NUMBER		
4 x 4	4.50-4.80	664-04800400-200	665-04800400-200	34	
4 x 4	4.80-5.10	664-05000400-200	665-05000400-200	42	
6 x 4 6 x 6	6.59-6.99	664-06630400-000	665-06630400-000	55	
6 x 6		664-06630600-200	665-06630600-200	61	
6 x 4	0.04.7.00	664-06900400-000	665-06900400-000	55	
6 x 6	6.84-7.30	664-06900600-200	665-06900600-200	61	
6 x 4	740 7 50	664-07200400-000	665-07200400-000	55	
6 x 6	7.10-7.50	664-07200600-200	665-07200600-200	61	
6 x 4	7 40 7 90	664-07450400-000	<mark>665-07450400-000</mark>	55	
6 x 6	7.40-7.80	664-07450600-200	665-07450600-200	61	
8 x 4	7.90-8.30	664-08000400-000	665-08000400-000	64	
8 x 6		664-08000600-000	665-08000600-000	72	
8 x 4		664-08630400-000	665-08630400-000	64	
8 x 6	8.62-9.06	664-08630600-000	665-08630600-000	72	
8 x 8		664-08630800-200	665-08630800-200	93	
8 x 4		664-09050400-000	665-09050400-000	64	
8 x 6	8.99-9.45	664-09050600-000	665-09050600-000	72	
8 x 8		664-09050800-200	665-09050800-200	93	
8 x 4		664-09450400-000	665-09450400-000	64	
8 x 6	9.20-9.60	664-09450600-000	665-09450600-000	72	
8 x 8		664-09450800-200	665-09450800-200	93	
8 x 4		664-09650400-000	665-09650400-000	64	
8 x 6	9.60-10.00	664-09650600-000	665-09650600-000	72	
8 x 8		664-09650800-200	665-09650800-200	93	

For MJ outlets, replace the last two 00s in the middle eight digits with MJ. Example: 664-127504MJ-000.

# 12.12

MUELLER CONSOLIDATED PIPE & SUPPLY CO. INC. 1500 COUNTY HOSPITAL RD

NASHVILLE TN 37218

#### 3"- 12" T-2361 RESILIENT WERGE 69 TAPPING VALVES - M.J. x FL. ENDS

Rev. 5-18

Catalog number
 T-2361-16 mechanical joint x flanged ends (with mechanical joint unassembled accessories)
 T-2361-19 mechanical joint x flanged ends (less mechanical joint accessories)

- □ Sizes 3", 4", 6", 8", 10", 12"
- Meets or exceeds all applicable requirements of ANSI/AWWA C515 Standard, UL 262 Listed, FM 1120/1130 Approved, and certified to ANSI/NSF 61 & 372
- Flanged end drilling complies with ASME/ANSI B16.1 Class 125 and with MSS SP-60
- Mechanical joint outlet complies with ANSI/AWWA C111 Standard
- □ Iron body with nominal 10 mils Mueller Pro-Gard<sup>™</sup> Fusion Bonded Epoxy Coated interior and exterior surfaces
- Epoxy coating meets or exceeds all applicable requirements of ANSI/AWWA C550 Standard
- Iron wedge, symmetrical and fully encapsulated with molded rubber; no exposed iron
- Non-rising stem (NRS)
- Triple O-ring seal (2 above the thrust collar and 1 below)
- 2" square wrench nut open left or open right
- 350 psig (2400 kPa/24 barg) maximum working pressure, 700 psig (4800 kPa/48 barg) static test pressure

Handwheel

- UL Listed/FM Approved 350 psig (2400 kPa/24 barg)
- Designed for potable water applications

#### Options

Position indicators

- $\hfill\square$  Stainless steel stem: type 304 and type 316
- $\hfill\square$  EPDM disc and o-rings

□ Low zinc, silicon bronze ASTM B98-C66100/H02 stem □

#### Resilient wedge gate valve parts

Catalog Part Number	Description	Material	Material standard
G-16	Bonnet bolts and nuts	316 Stainless steel	ASTM F593 (bolt) ASTM F594 (nut)
G-41	Stuffing box bolts and nuts	316 Stainless steel	ASTM F593 (bolt) ASTM F594 (nut)
G-49	Stem o-rings (3)	Nitrile	ASTM D2000
G-200	Wrench nut cap screw	316 Stainless steel	ASTM F593
G-201	Stuffing box seal	Nitrile	ASTM D2000
G-202	Wrench nut	Ductile Iron	ASTM A536 ▼
G-203	Stem	Bronze	ASTM B138
G-204	Handwheel (not shown)	Cast Iron +	ASTM A126 CL.B
G-205	Stem nut	Bronze	ASTM B584
G-206	Guide cap bearings	Acetal	-
G-207	Stuffing box with dirt seal	Ductile Iron Rubber	ASTM A536 ▼ ASTM D2000
G-208	Anti-friction washer (2)	Acetal	-
G-209	Wedge Rubber encapsulated	Ductile Iron* SBR	ASTM A536 ▼ ASTM D2000
G-210**	Bonnet	Ductile Iron	ASTM A536 ▼
G-211**	Bonnet O-ring ***	Nitrile	ASTM D2000
G-212**	Body	Ductile Iron	ASTM A536 ▼



\* Fully encapsulated in molded rubber with no iron exposed,

\*\* Previous to 1999 these parts on 4"-12" valves were designed with a gasket instead of an O-ring and with additional bolts. Confirm the type of seal when ordering a replacement gasket or O-ring.

▼ Material strength ASTM A536 65-45 minimum

^ Per ANSI/AWWA C111 working pressure above 250psi requires the use of a special gasket rated for higher pressure.

+ Manufacturer's option to change material to ductile iron ASTM A536

++ 3" valves meet or exceed all applicable requirements of ANSI/AWWA C509 standard

\*\*\* 3" valves use a bonnet gasket



T-2361-16 shown M.J. accessories shipped unassembled

#### **3"-12" T-2361 RESILIENT WEDGE TAPPING VALVES - M.J. X FL. ENDS**

MUELLER



**12465** 70



#### Dimensions

Dimensionet	Nominal Size						
Dimensions"	3"	4"	6"	8"	10"	12"	
A	12.38	14.19	18.0	21.50	25.50	28.62	
R	7.50	9.00	11.00	13.50	16.00	19.00	
D	3.97	5.00	7.00	9.00	11.00	13.00	
1	0.18	0.18	0.25	0.25	0.25	0.25	
Μ	4.73	6.24	6.75	7.75	8.52	7.25	
UU (bolt circle diameter)	6.19	7.50	9.50	11.75	14.25	17.00	
Ν	7.50	9.12	11.12	13.38	15.68	17.94	
B (number and size of holes for FL)	475	875	888	888	121.00	121.00	
Q (bore)	3.30	4.30	6.30	8.30	10.30	12.30	
FF	8.99	9.82	11.43	12.46	14.31	14.87	
O (number and size of holes for MJ)	475	488	688	688	888	888	
OO (bolt circle diameter)	6.19	7.50	9.50	11.75	14.00	16.25	
Turns to open	11	14	20.5	26.5	33	38.5	
Weight*	66	82	138	200	302	400	

\* All dimensions are in inches. All weights include accessories are in pounds and approximate.