TridentBoost™

Electrical and Plumbing Specifications

Duplex Booster System
with VMS Pumps

Triplex Booster System
with End-suction Pumps

TABLE OF CONTENTS

1160 Cranston Street, Cranston, RI | 401-942-8000

SECTION I: PIPING, VALVES, ACCESSORIES PACKAGE

MATERIAL SELECTION OPTIONS

BODY	DISC	STEM	SEAT
Cast Iron✦	Nylon 11 Coated Ductile Iron✦	416 Stainless Steel✦	BUNA-N Food Grade✦
Ductile Iron✦	316 Stainless Steel✦	304 Stainless Steel	EPDM Food Grade✦
Carbon Steel	Nickel Aluminum Bronze	316 Stainless Steel	FKM*
Aluminum	Coated Ductile Iron	Monel® K500	White BUNA-N Food Grade
	Halar® Coated Ductile Iron		Bonded EPDM
	304 Stainless Steel		Bonded BUNA-N
	Duplex Stainless Steel		
	Super Duplex Stainless Steel		
	Hastelloy®		

✦Standard Option

*FKM is the ASTM D1418 designation for fluorinated hydrocarbon elastomers (also called fluoroelastomers).

Monel® is a registered trademark of The International Nickel Company, Inc.

Halar® is a registered trademark of Solvay Solexis, Inc.

Hastelloy® is a registered trademark of Haynes International, Inc.

SERIES 31H

2"-20" (50mm-500mm)

Series 31H Lug valves are drilled and tapped to meet ASME Class 125/150 and PN16 flanges. Series 31H valves are designed for manual operation only.

PRESSURE RATINGS

BIDIRECTIONAL BUBBLE TIGHT SHUT OFF AND DEAD END SERVICE	
2"-20" (50-500mm)	250 psi (17.2 bar)
BODY: 250 psi (17.2 bar)	

VELOCITY LIMITS FOR ON/OFF SERVICES

FLUIDS: 30 ft/sec (9 m/s)	**GASES:** 175 ft/sec (54 m/s)

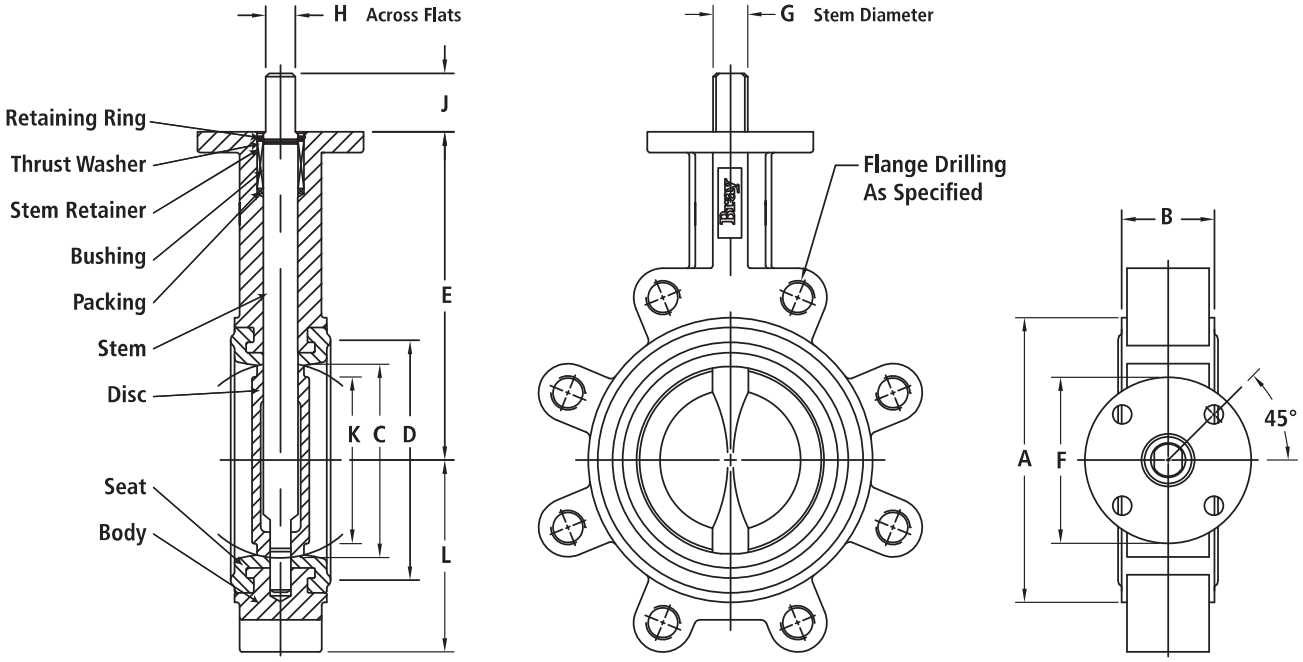
STANDARD MATERIAL SELECTIONS

Body	Cast Iron Ductile Iron
Disc	Nickel Aluminum Bronze Nylon 11 Coated Ductile Iron 316 Stainless Steel
Stem	416 Stainless Steel
Seat	Bonded EPDM Bonded BUNA-N

1160 Cranston Street, Cranston, RI | 401-942-8000

SECTION I: PIPING, VALVES, ACCESSORIES PACKAGE

Series 31H Lug



IMPERIAL DIMENSIONS: Inches																Lug Bolting Data		
Valve Size	A	B	C	D	E	F	Top Plate Drilling			G	H	J	K	L	Adapter Code	Weight (lbs)	Bolt Circle	No of Holes	Threads ISO Coarse
							BC	No of Holes	Hole Diameter										
2	3.69	1.62	2.00	2.84	5.50	3.54	2.76	4	.39	.55	39	1.25	1.32	2.30	A	7.0	4.75	4	5/8-11
2½	4.19	1.75	2.50	3.34	6.00	3.54	2.76	4	.39	.55	.39	1.25	1.91	2.57	A	8.0	5.50	4	5/8-11
3	4.88	1.75	3.00	4.03	6.25	3.54	2.76	4	.39	.55	.39	1.25	2.55	2.81	A	9.0	6.00	4	5/8-11
4	6.06	2.00	4.00	5.16	7.00	3.54	2.76	4	.39	.63	.43	1.25	3.57	4.09	B	15.0	7.50	8	5/8-11
5	7.12	2.12	5.00	6.16	7.50	3.54	2.76	4	.39	.75	.51	1.25	4.63	4.61	C	20.0	8.50	8	3/4-10
6	8.12	2.12	5.75	7.02	8.00	3.54	2.76	4	.39	.75	.51	1.25	5.45	5.06	C	23.0	9.50	8	3/4-10
8	10.50	2.50	7.75	9.47	9.50	5.91	4.92	4	.57	.87	.63	1.25	7.45	6.05	D	42.0	11.75	8	3/4-10
10	12.75	2.50	9.75	11.47	10.72	5.91	4.92	4	.57	1.18	.87	2.00	9.53	7.69	E	66.0	14.25	12	7/8-9
12	14.88	3.00	11.75	13.47	12.25	5.91	4.92	4	.57	1.18	.87	2.00	11.47	9.02	E	88.0	17.00	12	7/8-9

Note: K dimension is disc chordal dimension at valve face.

METRIC DIMENSIONS: Millimeters																Lug Bolting Data		
Valve Size	A	B	C	D	E	F	Top Plate Drilling			G	H	J	K	L	Adapter Code	Weight (Kg)	Bolt Circle	No of Holes	Threads ISO Coarse
							BC	No of Holes	Hole Diameter										
50	94	41.2	51	72	140	90	70	4	10	14	10	32	34	58	A	3	121	4	5/8-11
65	106	44.5	64	85	152	90	70	4	10	14	10	32	49	65	A	3.6	140	4	5/8-11
80	124	44.5	76	102	159	90	70	4	10	14	10	32	65	71	A	4.1	152	4	5/8-11
100	154	50.8	102	131	178	90	70	4	10	16	11	32	91	104	B	7	191	8	5/8-11
125	181	54.0	127	156	191	90	70	4	10	19	13	32	118	117	C	9	216	8	3/4-10
150	206	54.0	146	178	203	90	70	4	10	19	13	32	138	129	C	10	241	8	3/4-10
200	267	63.5	197	241	241	150	125	4	14	22	16	32	189	154	D	19	298	8	3/4-10
250	324	63.5	248	291	272	150	125	4	14	30	22	51	242	195	E	30	362	12	7/8-9
300	378	76.2	298	342	311	150	125	4	14	30	22	51	291	229	E	40	432	12	7/8-9

Note: K dimension is disc chordal dimension at valve face.

SECTION I: PIPING, VALVES, ACCESSORIES PACKAGE

OVERVIEW

The Rite® Series 210 wafer combination swing check valves are flow activated and Rite® Sized. The Rite® Series Check Valve inlet ports and disc have been shape optimized to achieve a fully open position at low flow rates (3 ft/s on average).

SPECIFICATIONS

Size Range	NPS 1" to 60"
	25mm to 1500mm
Temperature Range	Cryogenic to High Temperature (Pending Materials Selected)
Operating Pressure	ASME (125, 150, 300)
	DIN (PN10, 16, 25, 40)
Body Style	One-Piece Wafer Body Seat Ring Type
Leakage Rate	API 598

APPLICATIONS

- Chemical Processing
- Electrolysis
- Facilities/Skid
- HVAC
- Marine
- Nuclear
- Oil Transport
- Petrochemical
- Power Generation
- Refrigeration
- Storage & Transport
- Tank Trucks
- Water

MEDIA

- Acids
- Alkalis
- Corrosive Chemicals
- Dry Chlorine (Gas or Liquid)
- Gases
- Hydrogen
- Oxygen
- Water

DESIGN FEATURES

The Series 210 hard seated check valves offer:

SINGLE DOOR DESIGN:

Below numbered list can be referenced on various figures throughout document

1. Combination design utilizing both gravity + spring makes the valve easy to open/close, reducing water hammer.
2. Limited movement of internal parts during operation extends service life.
3. Elliptical inlet shape designed to accelerate line media through the valve.
4. Optimal diameter for high flow capacity.
5. Short face to face reducing weight and space between flanges.
6. Low cracking pressure design.
7. Quick response time (ideal for process lines with varying flows & control valves).
8. Customizable modular design, allows for adding special accessories to meet customer application requirements.
9. Cost & energy efficiency, requiring only one set of flange studs which span the valve, reducing in-service vibration.
10. Higher grade material as standard on seat ring type design enhances life expectancy.

Figure 01: Seat Ring Hard Seat Cutaway Front View.

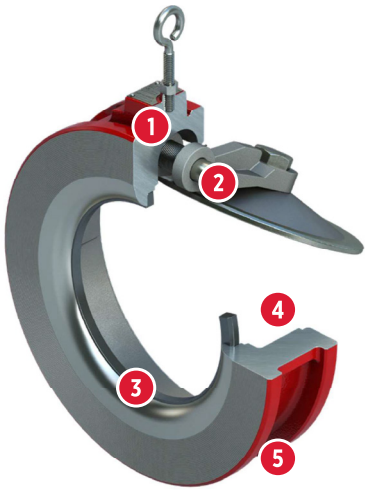


Figure 02: Seat Ring Hard Seat Cutaway Rear View.

301-663
Effective: 04/02/26

SECTION I: PIPING, VALVES, ACCESSORIES PACKAGE

DESIGN STANDARDS

Valve Design	ASME B16.34
Accessories Available	H100, SA01, SA1, SA2, SA3, SA4, SA4A, SA6, SA7, SA10, SA16, SA40, SA40A, SA50, etc.
Testing Standard	ASME B16.34, API 598
Face-to-Face	Manufacturer's Standard

CERTIFICATIONS AND APPROVALS

Certifications	CE/PED
	CRN
Approvals	NSF-61

Additional information is available in the Bray Rite® Ltd. Technical Sales Manual.

Figure 03: Seat Ring Hard Seat Exploded View.

MATERIAL OPTIONS[1]

Body Material determines whether design is integral type, or seat ring type. See below chart:

Body	Carbon Steel (ASTM A216 WCB)
	Cast Iron (ASTM A126 CLB)
	Ductile Iron (ASTM A395)
Hinge	Stainless Steel (ASTM A351 CF8M)
Seat Ring	Stainless Steel (ASTM A240 304), Stellite overlay optional
Spring	**Valve size:** ≤12": Stainless Steel (ASTM A313 316) standard duty
	Valve size: ≥14"+: Stainless Steel (ASTM A313 17-7 PH)
Spacer	Stainless Steel (ASTM A479 316), PTFE optional
Pin	Stainless Steel (ASTM A479 316)
Plug	Steel
Lock Nut	Steel Zinc Plated
Eye Bolt	Steel Zinc Plated
Nameplate	Stainless Steel (SS 316)
Disc	Stainless Steel (ASTM A351 CF8M)
Rivet	Steel Zinc Plated
Disc Nut	Stainless Steel (ASTM F594 316)

Rite® Series Check Valve seat ring type part number: V0215SMZ (For 2", Class 150, Carbon Steel ASTM A216 WCB Body, Metal Seat, SS Spacer, Series 210)

Note: [1] Dimensions available in ASME and DIN sizes.

Figure 04: Seat Ring Hard Seat In-Pipe View.

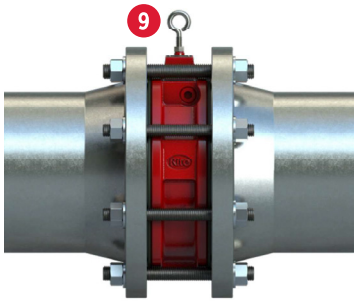
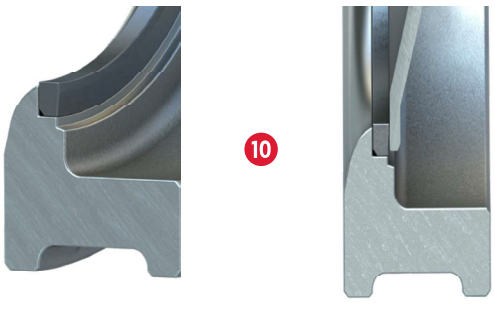


Figure 05: Seat Ring Hard Seat Close-Up Cutaway Views.



SECTION I: PIPING, VALVES, ACCESSORIES PACKAGE

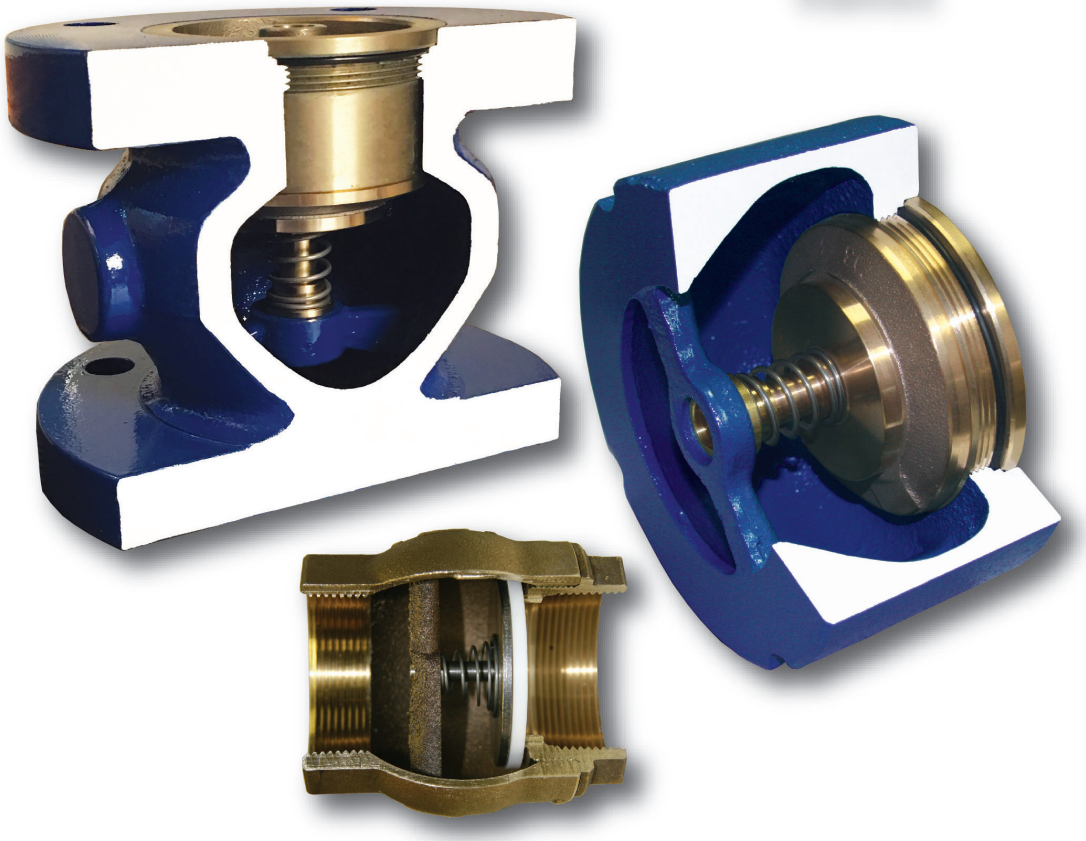
PUMP MODEL	CHECK VALVE
CI1206	Bray 210
CI1506	Bray 210
CI1507	Bray 210
CI1509	Bray 210
10VR-04	Bray 210
10VR-06	Valmatic 1400A Silent Check
15VR-03	Bray 210
15VR-04	Valmatic 1400A Silent Check
15VR-05	Valmatic 1400A Silent Check
20VR-04	Valmatic 1400A Silent Check10
20VR-05	Valmatic 1400A Silent Check10
30VR-02	Bray 210
30VR-03-2A	Bray 210
30VR-03-2A	Valmatic 1400A Silent Check

1160 Cranston Street, Cranston, RI | 401-942-8000

VAL-MATIC®

SHHH...SHHH...
Silent Check Valve

Silent Check Valves



www.valmatic.com

Certified Lead-Free
NSF/ANSI 61 & 372 Certified

1160 Cranston Street, Cranston, RI | 401-942-8000

SECTION I: PIPING, VALVES, ACCESSORIES PACKAGE

Val-Matic's quality of design and meticulous workmanship has set the standards by which all others are measured. Quality design features such as the AWWA **Ener•G® Ball Valve** with its energy efficient design, fusion bonded epoxy and adjustable resilient seating....**Cam-Centric® Plug Valves** have more requested features than any other eccentric plug valve....**American-BFV® Butterfly Valves** include a field replaceable seat without the need for special tools....**Tilted Disc® Check Valves** with high strength and wear resistant aluminum bronze trim as standard.... **Silent Check Valves** featuring combined resilient/metal-to-metal seating and are **NSF/ANSI 61 & 372 Certified**....**Sure Seal Foot Valves** provided with a heavy duty stainless steel screened inlet....**Swing-Flex® and Surgebuster® Check Valves** designed with an unrestricted full flow area....**Swing Check Valves** with field adjustable closure versatility....**Dual Disc® Check Valves** utilizing stabilized components to provide extended life.... **Air Release, Air/Vacuum and Combination Air Valves** provided standard with Type 316 stainless steel trim.... **VaultSafe®** family of products includes the **FloodSafe® Inflow Preventer**, **FrostSafe®** two-way damper and the **VentSafe®** vent pipe security cage. The **QuadroSphere® Trunnion Ball Valve** features a unique ball design with recessed surfaces creating additional flow paths to provide a self-cleaning action and reduced wear and torque.

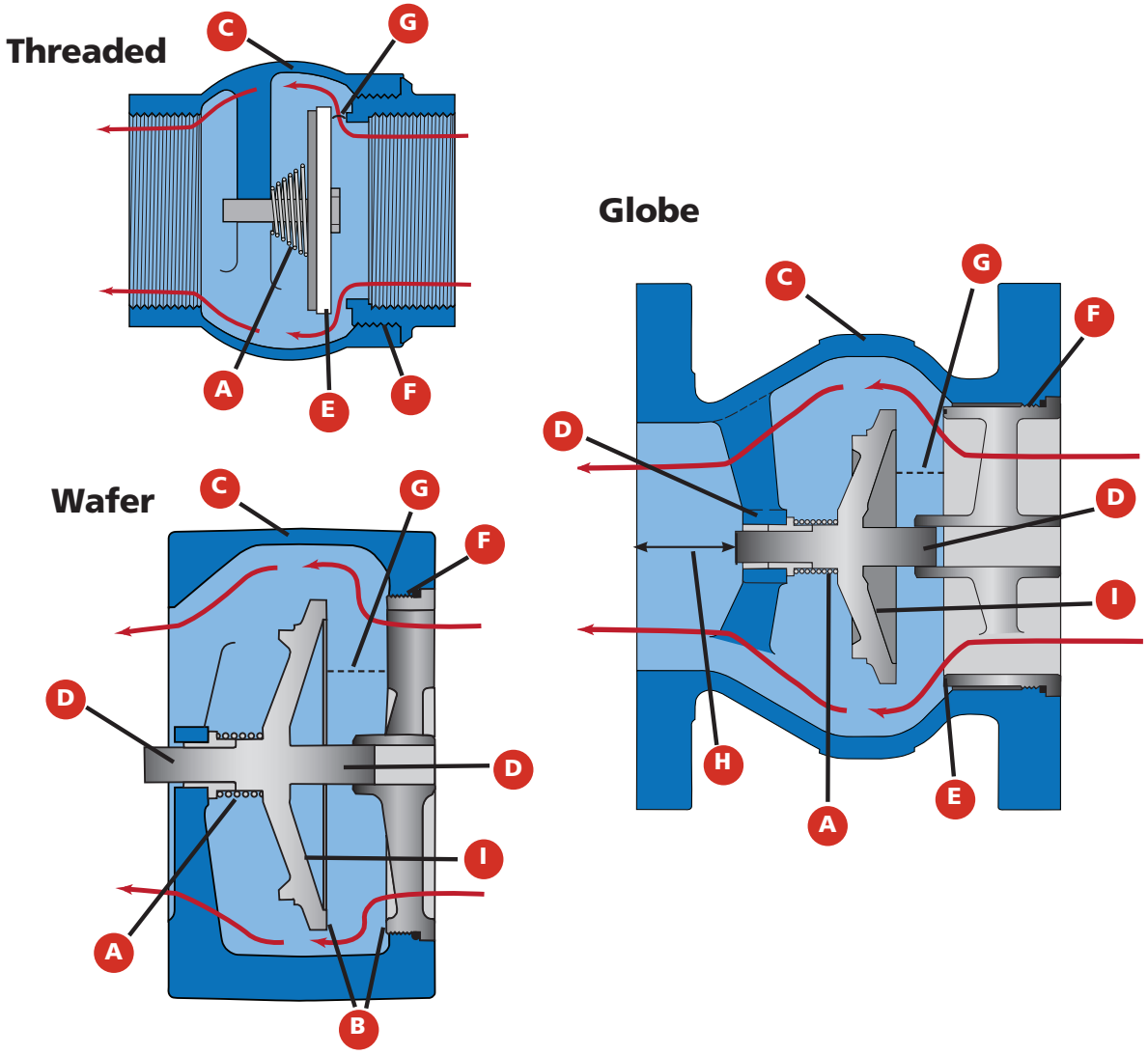
Val-Matic is totally committed to providing the highest quality valves and outstanding service to our customers. Complete customer satisfaction is our goal. **Make the change to quality, specify Val-Matic!**

VAL-MATIC® *Your Valve Experts™*

Val-Matic Valve and Manufacturing Corp.
905 Riverside Drive, Elmhurst, IL 60126
Phone: 630-941-7600 • Fax: 630-941-8042
www.valmatic.com • valves@valmatic.com

11/17

Feature Hightlights



A. Heavy Duty Spring
Tested over 100,000 cycles to ensure valve dependability and non-slam closure.

B. Metal-to-Metal Seating
For durability and extended life. Corrosion free seat and disc sealing surfaces are precision-machined flat and smooth to meet AWWA and MSS metal seat leakage criteria.

C. Expanded Flow Area
Tear-drop contour reduces headloss and provides energy savings.

D. Double Guided Disc
Prevents vibration and wear, ensuring long valve life.

E. Resilient Seat
Provides zero leakage. Standard on Threaded style, optional on Wafer and Globe styles.

F. Threaded Seat
12 in. and smaller seats are threaded to secure the seat at full rated pressure.

G. Short Stroke
The combination of short stroke and spring return assures non-slam closure.

H. Mate-ability
Globe style sizes 2½ through 10 in. mate to wafer style butterfly valves without the use of spool pieces.

I. Concave Disc
The disc is concave to provide for disc stabilization, maximum strength and a minimum flow velocity to open the valve.

301-663
Effective: 04/02/26

1160 Cranston Street, Cranston, RI | 401-942-8000

Features & Benefits

The Val-Matic Silent Check Valve has been the preferred choice by users for over 50 years. Its silent operation, low cost and proven performance in clean water applications have made it a preferred choice by design engineers and system operators.

Silent Operation

The Silent Check Valve is preferred over other types of valves because of its silent operation which reduces shock and water hammer. The Silent Check Valve is the fastest closing check valve because of its short stroke and spring-assisted closure. When flow occurs, the disc is lifted off the seat to allow forward flow. When the pump is stopped, the spring in the valve forces the disc closed before flow reverses, providing silent closure. Dynamic check valve tests show that surge pressure is significantly reduced when a silent check valve is used. (See Figures 1 & 2)

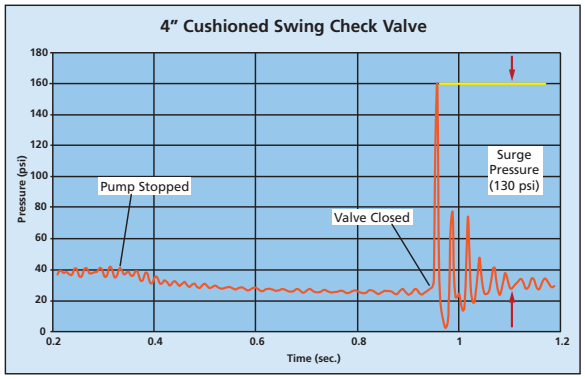


Figure 1 - Cushioned Swing Check Valve Dynamic Test Results

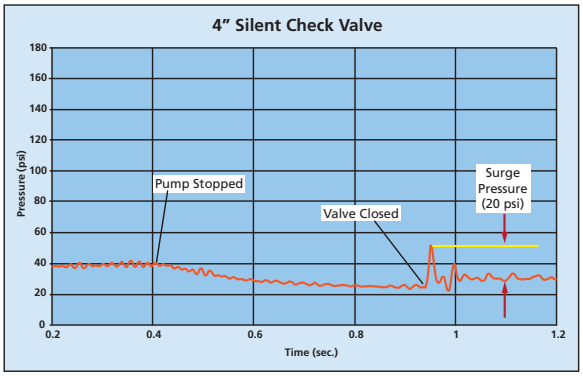


Figure 2 - Silent Check Valve Dynamic Test Results

Optional Resilient Seat

The Val-Matic Wafer and Globe Silent Check Valves are available with an optional O-ring seat design that provides zero leakage at both high and low pressures. (See Figure 3) The unique seat design cavity is tapered to secure the seal under flowing conditions.

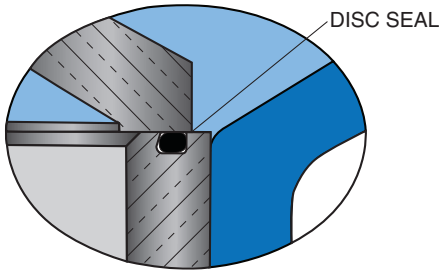


Figure 3 - Resilient Seating Detail

Installation Versatility

The design of the valve allows operation in any installation position. All three styles of Silent Check Valves can be installed in either horizontal or vertical lines with the flow up or down. Valves 14 in. and larger require a severe duty spring for flow down applications. Wafer sizes 2 - 6 in. are dual rated to fit between both ASME B16.1 Class 125 and 250 flanges. In applications where space is limited, the compact wafer style is the preferred choice. 12 in. and smaller valves with threaded seats can be installed directly adjacent to expansion joints and couplings without relying on the mating flange to support the seat.

Corrosion-Resistant Construction

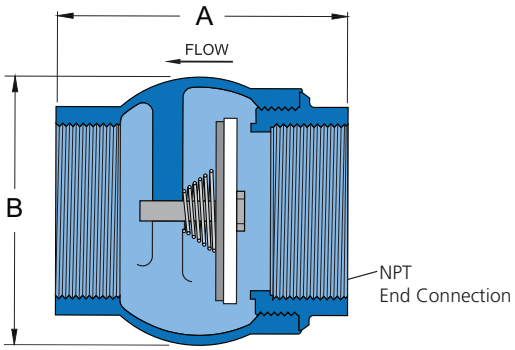
Wafer and globe style valves are available in all stainless steel construction in accordance with ASME B16.34, Class 150 requirements. The cast austenitic stainless steel construction provides a high level of corrosion resistance for chemical, mining, pulp and paper, and other general industry applications.

Product Certifications

Val-Matic Silent Check Valves are NSF/ANSI 372 certified Lead-Free. Wafer and globe style valves are NSF/ANSI 61 certified for drinking water. Wafer style (2-10 in.) and globe style (2½-12 in.) Silent Check Valves are Factory Mutual approved for use in fire protection systems. All Val-Matic Valves are manufactured under a certified ISO 9001 quality management system.

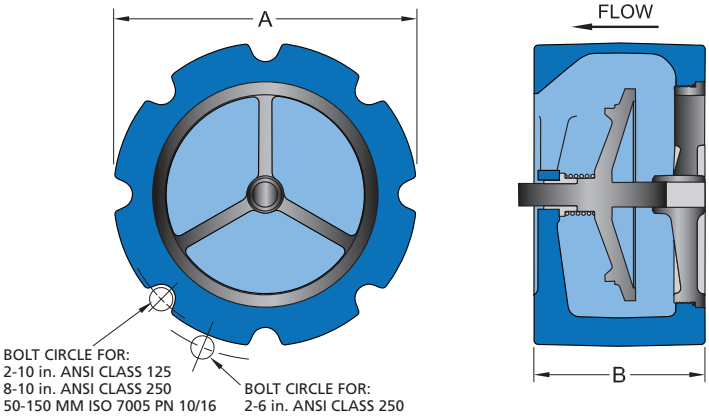
Installation Dimensions

Series 1400THR - Threaded



Dimensions				
Valve Size (NPT)	CWP psig (Bar)	A in (mm)	B in (mm)	Weight lb (kg)
1/2	250 (17.2)	2.06 (52.3)	1.38 (35.0)	.38 (.17)
3/4	250 (17.2)	2.25 (57.1)	1.63 (41.4)	.48 (.22)
1	250 (17.2)	2.63 (66.8)	2.00 (50.8)	.81 (.37)
1 1/4	250 (17.2)	2.94 (74.6)	2.38 (60.4)	1.22 (.55)
1 1/2	250 (17.2)	3.31 (84)	2.75 (69.8)	1.61 (.73)
2	250 (17.2)	3.68 (93.4)	3.38 (85.8)	5.13 (2.33)

Series 1400A - Wafer



Dimensions - Inch					
Valve Size	CWP (psig)	ANSI Class	A	B	Weight (lb)
2*	400	125/250	4.25	2.63	6
2 1/2*	400	125/250	5.00	2.88	7
3*	400	125/250	5.75	3.13	11
4*	400	125/250	7.00	4.00	19
5*	400	125/250	8.75	4.75	28
6*	400	125/250	9.75	5.50	41
8	200	125	13.38	6.50	81
	400	250	13.38	6.50	89
10	200	125	16.00	8.25	99
	400	250	16.00	8.25	137

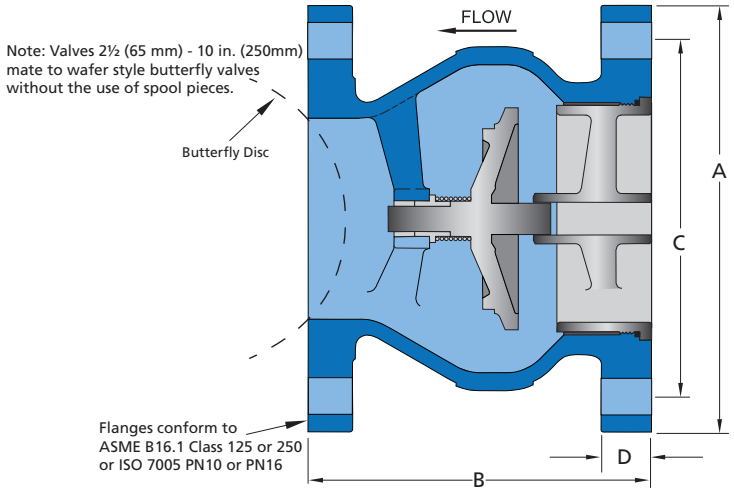
Dimensions - Metric					
Valve Size	CWP (Bar)	PN Class	A	B	Weight (kg)
50	27.6	10/16	107.9	66.8	3
65	27.6	10/16	127	73.1	4
80	27.6	10/16	146	79.5	5
100	27.6	10/16	177.8	101.6	9
125	27.6	10/16	222.2	107.9	13
150	27.6	10/16	247.6	139.7	19
200	27.6	16	342.9	165.1	40
250	27.6	16	406.4	215.9	62

***Note:** Sizes 2 - 6 in. are dual rated to fit between both ANSI Class 125 and 250 flanges.

301-663
Effective: 04/02/26

Installation Dimensions

Series 1800 - Globe



Dimensions - Inch

Valve Size	CWP (psig)	ANSI Class	A	B	C	D	Weight (lb)
2 1/2	200	125	7.00	5.50	5.50	0.69	19
	400	250	7.50	5.50	5.88	1.00	30
3	200	125	7.50	6.00	6.00	0.94	28
	400	250	8.25	6.00	6.63	1.13	36
4	200	125	9.00	7.25	7.50	0.94	43
	400	250	10.00	7.25	7.88	1.25	59
5	200	125	10.00	8.50	8.50	0.94	55
	400	250	11.00	8.50	9.75	1.38	78
6	200	125	11.00	9.75	9.50	1.00	78
	400	250	12.50	9.75	10.63	1.44	103
8	200	125	13.50	12.50	11.75	1.13	102
	400	250	15.00	12.50	13.00	1.63	179
10	200	125	16.00	15.50	14.25	1.19	208
	400	250	17.50	15.50	15.25	1.88	253
12	200	125	19.00	14.25	17.00	1.25	294
	400	250	20.50	14.25	17.75	2.00	401
14	150	125	21.00	15.75	18.75	1.38	380
	300	250	23.00	15.75	20.25	2.13	511
16	150	125	23.50	17.63	21.25	1.44	501
	300	250	25.50	17.63	22.50	2.25	697
18	150	125	25.00	18.75	22.75	1.56	724
	300	250	28.00	18.75	24.75	2.38	959
20	150	125	27.50	20.63	25.00	1.69	890
	300	250	30.50	20.63	27.00	2.50	1,180
24	150	125	32.00	24.00	29.50	1.88	1,220
	300	250	36.00	24.00	32.00	2.75	1,680
30	150	125	38.75	29.25	36.00	2.13	2,100
	300	250	43.00	29.25	39.25	3.00	2,700
36	150	125	46.00	45.00	42.75	2.38	4,400
	300	250	50.00	46.00	46.00	3.38	5,100
42	150	125	53.00	50.00	49.50	2.63	7,200
	300	250	57.00	50.00	52.75	3.69	7,900

Dimensions - Metric

Valve Size	CWP (Bar)	PN Class	A	B	C	D	Weight (kg)
65	16	10/16	178	140	145	18	9
80	16	10/16	192	152	160	24	13
100	16	10/16	220	184	180	24	20
125	16	10/16	250	216	210	24	25
150	16	10/16	285	248	240	25	35
200	16	10	340	318	295	29	46
	16	16	340	318	295	29	81
250	16	10	395	362	350	30	94
	16	16	405	362	355	30	114
300	16	10	445	394	400	32	133
	16	16	460	394	410	32	181
350	10	10	505	400	460	35	172
	16	16	520	400	470	35	231
400	10	10	565	448	515	37	227
	16	16	580	448	525	37	316
450	10	10	615	476	565	40	328
	16	16	640	476	585	40	434
500	10	10	670	524	620	43	403
	16	16	715	524	650	43	535
600	10	10	780	610	725	48	553
	16	16	840	610	770	48	762

301-663
Effective: 04/02/26

Valve Construction

PRESSURE RATINGS

MAXIMUM PRESSURE RATINGS				
SERIES	**DESCRIPTION**	**SIZE RANGE**	**END CONNECTION**	**CWP psig (Bar)**
1400THR	Threaded	1/2" - 2" (15-50mm)	Threaded NPT	250 (17.2)
1400A	Wafer Style	2" - 6" (50-150mm)	Wafer Class 125/250	400 (27.6)
		8" - 10" (200-250mm)	Wafer Class 125	200 (13.8)
		8" - 10" (200-250mm)	Wafer Class 250	400 (27.6)
1400A.4	Wafer Style Stainless Steel	2" - 10" (50-250mm)	Wafer Class 150	275 (19)
1800A	Globe Style	2 1/2" - 12" (65-250mm)	Flanged Class 125	200 (13.8)
		2 1/2" - 12" (65-250mm)	Flanged Class 250	400 (27.6)
1800A.4	Globe Style Stainless Steel	2 1/2" - 12" (65-250mm)	Flanged Class 150	275 (19)
1800	Globe Style	14"- 42" (300-1050mm)	Flanged Class 125	150 (10.3)
		14" - 42" (300-1050mm)	Flanged Class 250	300 (20.7)

MATERIALS OF CONSTRUCTION

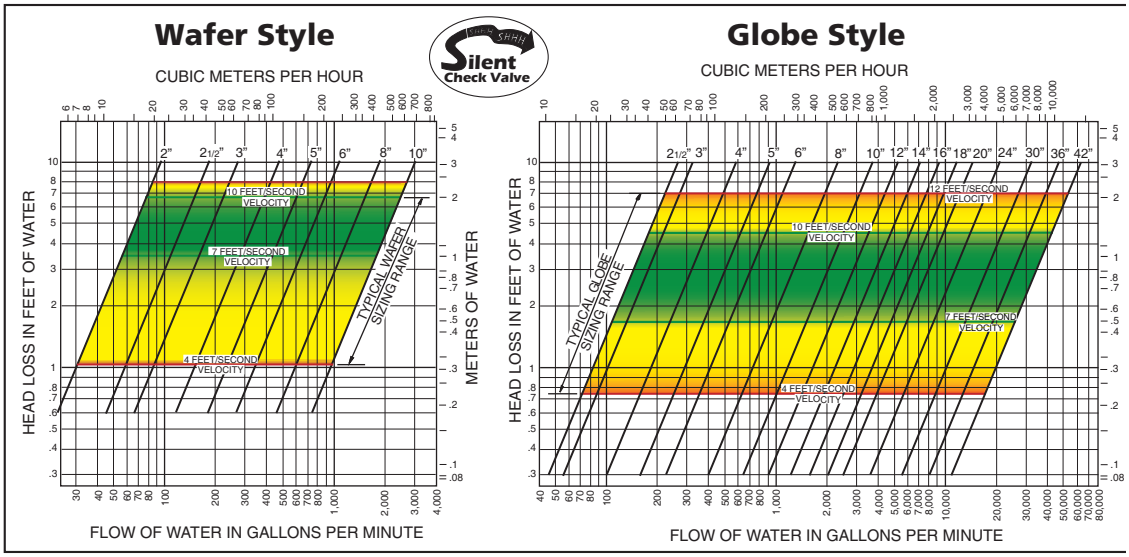
Threaded Style

COMPONENT	STANDARD
Body	Lead-Free Bronze ASTM B584 C87600
Disc	Lead-Free Bronze ASTM B584 C87600
Seat	PTFE
Spring	T316 Stainless Steel

Wafer & Globe Style

COMPONENT	STANDARD	OPTIONAL
Body -125/250 2" - 12"	Ductile Iron ASTM A536, Grade 65-45-12	Cast Iron ASTM A126, Class B
Body - 125 14" & Larger	Cast Iron ASTM A126, Class B	Ductile Iron A53 Grade 65-45-12
Body - 250 14" & Larger	Ductile Iron ASTM A536, Grade 65-45-12	Cast Iron ASTM A126, Class B
Disc	Lead-Free Bronze ASTM B584 C87600	Stainless Steel A351 Grade CF8
Seat	Lead-Free Bronze ASTM B584 C87600	Stainless Steel A3 Grade CF8M
Resilient Seat	-	Buna-N EPDM
Spring	T316 Stainless Steel	Severe Duty T316 Stainless St

Headloss Chart



Size	2	2-1/2	3	4	5	6	8	10	12	14	16	18	20	24	30	36	42
Wafer Cv	43	88	130	228	350	520	900	1450	-	-	-	-	-	-	-	-	-
Globe Cv	-	127	155	278	435	625	1115	1770	2500	3400	4400	5600	6900	10,000	15,400	22,400	30,400

301-663
Effective: 04/02/26

Specifications

SCOPE

1.1 This specification covers the design, manufacture, and testing of 1/2 in. (15 mm) through 2 in. (50 mm) Bronze Threaded Silent Check Valves, 2 in. (50 mm) through 42 in. (1050 mm) Wafer and Globe Silent Check Valves suitable for pressures up to 500 psig (3450 kPa) water service.

1.2 The Check Valve shall be of the silent operating type that begins to close as the forward flow diminishes and fully closes at zero velocity preventing flow reversal and resultant water hammer. The dynamic characteristics of the valve shall be published and verified by independent laboratory test data.

STANDARDS AND APPROVALS

2.1 The valves for use in fire protection systems shall be Factory Mutual approved in sizes 2 1/2 in.- 12 in.

2.2 Stainless steel valves shall meet the requirements of ASME B16.34 and MSS SP-126.

2.3 Wafer and Globe valves used in potable water service shall be certified to NSF/ANSI 61, Drinking Water System Components – Health Effects, and all valves shall be certified Lead-Free in accordance with NSF/ANSI 372.

2.4 Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited, certifying body.

CONNECTIONS

3.1 Threaded Style valves shall be provided in sizes ½ in. (15mm) through 2 in. (50mm) and have a two-piece body with female threaded NPT ends.

3.2 Globe style valves shall be provided in sizes 2 1/2 in. (65 mm) through 42 in. (1050 mm) and have flat faced flanges in accordance with ASME B16.1 for Class 125 or Class 250 iron flanges or in sizes 65 mm to 600 mm in accordance with ISO 7005 PN10 or PN16. Sizes 10 in. (250 mm) and smaller flanged valves shall be capable of mating directly to a wafer butterfly valve without disc interference.

3.3 Wafer style valves shall be provided in sizes 2 in. (50 mm) through 10 in. (250 mm) for installation between ASME B16.1 Class 125 or Class 250 iron flanges or sizes 50 mm to 100 mm in accordance with ISO 7005 PN10 or PN16. Stainless steel wafer style valves shall include raised faces for installation between ASME B16.5 Class 150 flanges.

DESIGN

4.1 The valve design shall incorporate a center guided, spring loaded disc and have a short linear stroke that generates a flow area equal to the nominal valve size.

4.2 The operation of the valve shall not be affected by the position of installation. The valve shall be capable of operating in the horizontal or vertical positions with the flow up or down. Heavy duty springs for vertical flow down installations shall be provided when specified on 14 in. and larger valves.

4.3 All component parts shall be field replaceable without the need of special tools. Wafer and Globe styles shall be provided with a replaceable guide bushing held in position by the spring. The spring shall be designed to withstand 100,000 cycles without failure and provide a cracking pressure of 0.5 psi for vertical installation.

4.4 The wafer and globe disc shall be concave to the flow direction providing for disc stabilization, maximum strength, and a minimum flow velocity to open the valve.

4.5 The valve disc and seat shall have a seating surface finish of 16 micro-inch or better to ensure positive seating at all pressures. The leakage rate shall not exceed the allowable rate for metal seated valves allowed by AWWA C508 and MSS SP-125 or 1 fl oz (30 ml) per hour per inch of nominal size.

4.6 Wafer and Globe style valve seats through 12 in. shall be fully retained to withstand full rated pressure of the valve without the seat mating flange. Globe style valve seats 14 in. and larger shall be contained with a machined counterbore and restrained by the mating flange and gasket.

MATERIALS

5.1 The threaded valve body and disc shall be lead free materials. The seat shall be PTFE. The spring shall be Type 316 stainless steel.

5.2 For Class 125 and Class 250 Globe and Wafer valves, bodies shall be ASTM A536 Grade 65-45-12 ductile iron up to 12". For Globe valves 14" and larger, Class 125 bodies shall be ASTM A126 Class B cast iron and Class 250 bodies shall be ASTM A536 Grade 65-45-12. ASTM A536 Grade 65-45-12 ductile iron is an optional body material for 14" and larger Class 125 Globe valves. Bodies for Class 150 stainless steel valves shall be ASTM A351 Grade CF8M.

5.3 Globe and wafer seat and disc shall be ASTM B584 Alloy C87600 lead-free bronze or ASTM B148 Alloy C95500 aluminum bronze. Optional trim material includes ASTM A351 Grade CF8M stainless steel.

5.4 Globe and wafer compression spring shall be ASTM A313 Type 316 stainless steel with ground ends.

OPTIONS

6.1 A resilient seal shall be provided on the seat when specified to provide zero leakage at both high and low pressures without overloading or damaging the seal. The seal design shall provide both a metal-to-metal and a metal-to-resilient seal.

6.2 Valve interiors and exteriors shall be coated with an NSF/ANSI 61 certified fusion bonded epoxy in accordance with AWWA C550 when specified.

MANUFACTURE

7.1 The valves shall be hydrostatically tested at a minimum 1.5 times their rated cold working pressure and seat tested at the valve CWP. When requested, the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals.

7.2 The exterior of the valve shall be coated with a universal alkyd primer.

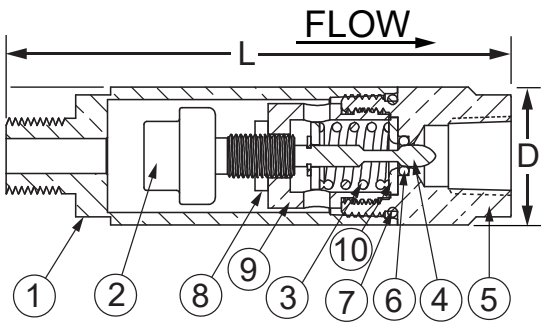
7.3 Silent Check Valves shall be Series #1400THR.1 (Threaded Style), Series #1400A (Wafer Style) or 1800A (Globe Style) as manufactured by Val-Matic® Valve & Mfg. Corporation, Elmhurst, IL. USA or approved equal.

301-663
Effective: 04/02/26

1160 Cranston Street, Cranston, RI | 401-942-8000

PUMP THERMAL RELIEF VALVE

PARTS & MATERIALS



ITEM	DESCRIPTION	MATERIAL
1	VALVE BODY	Brass or 300 Series SS
2	THERMAL ACTUATOR	300 Series SS
3	OPERATING SPRING	300 Series SS
4	RAM-TYPE PLUG	300 Series SS
5	SEAT FITTING	Brass or 300 Series SS
6	SEAT SEAL	BUNA
7	BODY SEAL	BUNA
8	CALIBRATION LOCKNUT	300 Series SS
9	SEAT RETAINER	Brass or 300 Series SS
10	SEAT INSERT	Brass or 300 Series SS

DIMENSIONS & CAPACITIES

SIZE (NPT)	D		L		Weight		C_v	Maximum Operating Pressure	Maximum Temperature
	in	mm	in	mm	Lb	Kg			
1/4" Brass	1.0	25	3.6	89	0.4	0.2	0.5	300 PSIG (20.7 BAR)	250°F (121°C)
1/4" SS								400 PSIG (27.6 BAR)	

ORDERING

Part Number	Description
242 - 000000 - XXX	1/4" ECONO/HAT-RA M/F Brass
242 - 010000 - XXX	1/4" ECONO/HAT-RA M/F 300 Series SS

NOTES

1. Full open temperatures "XXX" available: 040°F, 045°F, 050°F, 060°F, 070°F, 075°F, 085°F, 095°F, 100°F, 105°F, 110°F, 115°F, 120°F, 125°F, 130°F, 140°F, 150°F, 160°F, 170°F, 175°F, 180°F, 190°F, 200°F and 210°F.
2. Note: Closing temperature is typically 10°F below opening temperature.
3. A #20 mesh strainer is recommended.
4. Warranty information disclosed at www.thermomegatech.com/terms-conditions/

ThermOmegaTech®, Inc.
353 Ivyland Road
Warminster, PA 18974
1-877-379-8258
www.ThermOmegaTech.com

ECONO/HAT-RA
5/3/2024

Because of continuous improvements, ThermOmegaTech®, Inc. reserves the right to change the design and specifications without notice

New Version

GOT SIMPLE

For details | Concept movie

The GOT SIMPLE Series upgrade brings the most demanded new features

10" widescreen, GS2110-WTBD-N

7" widescreen, GS2107-WTBD-N

For the details of the GOT SIMPLE Series, please refer to the Graphic Operation Terminal GOT SIMPLE Series catalog (L(NA)08649ENG).

The GOT SIMPLE Series with the most demanded features enables remote maintenance

User memory capacity is now increased to 15 MB. Outline fonts offer improved visibility of screen display.
In addition, remote maintenance is possible using the VNC server function, and thus monitoring devices from a remote location improves work efficiency.

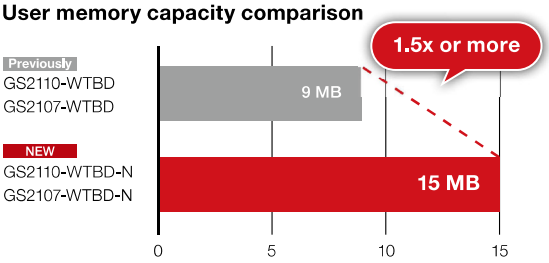
* To design screens of the upgraded GOT SIMPLE Series, it is required to use GT Works3 Version1.250L or later.

Item	Specifications	
	GS2110-WTBD-N	GS2107-WTBD-N
Display	10" widescreen, TFT color LCD, 65536 colors	7" widescreen, TFT color LCD, 65536 colors
Resolution	WVGA: 800 × 480 dots	
Backlight	White LED	
User memory	Memory for storage (ROM): 15 MB	
Standard interface	Ethernet, RS-232, RS-422/485 USB device (USB Mini-B): 1 channel (USB1.1 (Full-Speed 12 Mbps)) SD memory card interface	

Expanded user memory capacity (9 MB ➧ 15 MB)

The user memory capacity has been expanded to 15 MB from the GOT SIMPLE Series previous model. There is no need to worry about the project data size when designing screens.

User memory capacity comparison



Support RS-485 connection

A common interface for RS-422 and RS-485 connections is available. Temperature controllers and MODBUS® devices can be connected.

Temperature controllers and MODBUS® devices

SECTION 2: ELECTRICAL PACKAGE

MITSUBISHI ELECTRIC EUROPE B.V.

Industrial Automation
Mitsubishi-Electric-Platz 1 40882 Ratingen Deutschland
Telefon +49 (0) 2102 486-0 Fax +49 (0) 2102 486-1120
https://emea.mitsubishielectric.com/fa

MATERIAL FACT SHEET 297436 FX5U-32MR/DS

General Data

Product Hierarchy	IAD21701
	Compact PLC
	FX5U CPU
Ext. Material Group	10 STANDARD ITEM
ABC Indicator	A (Available from Stock)

e-shop: https://mitsubishi-electric-eshop.mee.com/mee/FA_IA/EUR/en/p/000000000000737860

FA-COM PLC: Main Unit

Series	MELSEC IQ-F SERIES
Type	FX5U
Power Supply (V)	24
Current Type	DC
Program Memory	64K STEPS
Program Memory Unit	FLASH
Integrated Digital Inputs	16
Integrated Digital Outputs	16
Integrated Analogue Inputs	2
Output Type	RELAY
Local I/O Points	256
Local + Remote I/O Points	512
Expandable	YES
Cycle Time LD (ns)	34
Cycle Time MOV (ns)	34
Ethernet Port	1
RS-485	1
Power Consumption (W)	30
Buffer Battery	OPTION
Protection Class	IP10
Min. Ambient Temperature (°C)	-20
Max. Ambient Temperature (°C)	55

Product Dimensions & Weight

Width (mm)	150
Height (mm)	90
Depth (mm)	83
Weight (kg)	0,65

Logistic Dimensions & Gross Weight

Length (cm)	17,0
Width (cm)	12,0
Height (cm)	11,0
Gross Weight (kg)	0,809
Volume (cdm)	2,244

Stock Data

Planned Delivery Time (Days)	160

Life Cycle

Sales Start	30.06.2016
Predecessor	No Predecessor

CFW500 - VARIABLE SPEED DRIVE

High performance and **reliability** to improve your production process

1160 Cranston Street, Cranston, RI | 401-942-8000

SECTION 2: ELECTRICAL PACKAGE

Coding[1)]

www.weg.net

1	2	3	4	5	6	7	8	9	10	11	12
CFW500	A	02P6	T	4	NB	20	C2	---	---	---	---

1 - CFW500 variable speed drive
2 - Size of the CFW500, according to table 1 below
3 - Rated output current, according to table 1 below

Power supply	Single-phase (S)	Single-phase or three-phase (B)	Three-phase (T)		
	200-240 Vac	200-240 Vac	200-240 Vac	380-480 Vac	500-600 Vac
Voltage	01P6 = 1.6 A 02P6 = 2.6 A 04P3 = 4.3 A 07P0 = 7.0 A 07P3 = 7.3 A 10P0 = 10.0 A	01P6 = 1.6 A 02P6 = 2.6 A 04P3 = 4.3 A 07P3 = 7.3 A 10P0 = 10.0 A	07P0 = 7.0 A 09P6 = 9.6 A 16P0 = 16 A 24P0 = 24 A 28P0 = 28 A 33P0 = 33 A 47P0 = 47 A 56P0 = 56 A 77P0 = 77 A 88P0 = 88 A 0105 = 105 A 0145 = 145 A 0180 = 180 A 0211 = 211 A	01P0 = 1.0 A 01P6 = 1.6 A 02P6 = 2.6 A 04P3 = 4.3 A 06P1 = 6.1 A 02P6 = 2.6 A 04P3 = 4.3 A 06P5 = 6.5 A 10P0 = 10.0 A 14P0 = 14.0 A 16P0 = 16.0 A 24P0 = 24.0 A 31P0 = 31.0 A 39P0 = 39.0 A 49P0 = 49.0 A 77P0 = 77.0 A 88P0 = 88.0 A 0105 = 105 A 0142 = 142 A 0180 = 180 A 0211 = 211 A	01P7 = 1.7 A 03P0 = 3.0 A 04P3 = 4.3 A 07P0 = 7.0 A 10P0 = 10.0 A 12P0 = 12.0 A

4 - Number of phases

S	Single-phase power supply
B	Single or three-phase power supply
T	Three-phase power supply

5 - Rated voltage

2	200-240 V
4	380-480 V
5	500-600 V

6 - Internal dynamic braking[2)]

NB	Without internal dynamic braking IGBT
DB	With internal dynamic braking IGBT

7 - Protection degree

20	IP20 protection degree
N1	Cabinet type 1 protection degree
66	IP66 protection degree (Type 4x)

8 - RFI filter[3)]

Blank	Without internal RFI filter
C2	With internal RFI filter - category 2
C3	With internal RFI filter - category 3

9 - Disconnect switch[4)]

Blank	Without disconnect switch
DS	With disconnect switch

10 - Safety function[5)]

Blank	Without safety function
Y2	With safety function (STO and SS1-t) as per EN 61800

11 - Special hardware versions - H xx

11.1 - Plug-in module

Blank	With standard plug-in module
H00	Without plug-in module

11.2 - Coating for harsh environments

Blank	Class 3C2 - Standard conformal coating
EC	Class 3C3 - Extra coating

12 - Special software version - S xx

Blank	Standard software
Sxx	Special software

13 - Generation

Blank	First generation
G2	Second generation

Notes: 1) Other configurations available upon request.
2) Braking resistor not included. Braking IGBT is available as standard for the whole CFW500 line, except for frame size A of IP20 version.
3) Conducted emission level (IEC 61800-3).
In order to minimize such problem, WEG variable speed drives contain common-mode capacitive filters, which are enough to avoid this type of interference in most cases. If necessary, our inverters also have radio frequency (RFI) filters to reduce even more those high-frequency electromagnetic interference signals. Item 8 of the table above shows how to select the models of internal RFI filters for the CFW500.
Definitions of IEC/EN 61800-3 standard. Categories:
Category C1: variable speed drives with voltage rating below 1,000 V and intended for application in the "First Environment".
Category C2: inverters with voltage rating below 1,000 V not provided with plugs or movable installations, and, when applied in the "First Environment", they must be installed and commissioned by a professional.
Category C3: inverters with voltage ratings below 1,000 V developed for application in the "Second Environment" and not designed for application in the "First Environment".

SECTION 2: ELECTRICAL PACKAGE

Coding

CFW500 IP20 or NEMA1 - 200-240 V

Coding (available options for each model)									
1, 2, 3, 4 and 5	6	7	8	9	10	11.1	11.2	12	13
CFW500A01P6S2	NB	20 or N1	Blank or C2	Blank	Blank	Blank or H00	Blank or EC	Blank or Sxx	G2
CFW500A02P6S2									
CFW500A04P3S2									
CFW500A07P0S2			Blank or C3						
CFW500B07P3S2	DB		C2						
CFW500B10P0S2									
CFW500A01P6B2	NB		Blank						
CFW500A02P6B2									
CFW500A04P3B2									
CFW500B07P3B2	DB								
CFW500B10P0B2									
CFW500A07P0T2	NB								
CFW500A09P6T2									
CFW500B16P0T2	DB		Blank or C3						
CFW500C24P0T2									
CFW500D28P0T2									
CFW500D33P0T2									
CFW500D47P0T2									
CFW500E56P0T2									
CFW500F77P0T2									
CFW500F88P0T2									
CFW500F0105T2									
CFW500G0145T2	NB or DB								
CFW500G0180T2									
CFW500G0211T2									

CFW500 IP20 or NEMA1 - 380-480 V

Coding (available options for each model)									
1, 2, 3, 4 and 5	6	7	8	9	10	11.1	11.2	12	13
CFW500A01P0T4	NB	20 or N1	Blank or C2	Blank	Blank	Blank or H00	Blank or EC	Blank or Sxx	G2
CFW500A01P6T4									
CFW500A02P6T4									
CFW500A04P3T4									
CFW500A06P1T4			Blank or C3						
CFW500B02P6T4	DB		Blank or C2						
CFW500B04P3T4									
CFW500B06P5T4									
CFW500B10P0T4			Blank or C3						
CFW500C14P0T4			Blank or C2						
CFW500C16P0T4									
CFW500D24P0T4			Blank or C3						
CFW500D31P0T4									
CFW500E39P0T4									
CFW500E49P0T4									
CFW500F77P0T4									
CFW500F88P0T4									
CFW500F0105T4									
CFW500G0142T4	NB or DB								
CFW500G0180T4									
CFW500G0211T4									

CFW500 IP20 or NEMA1 - 500-600 V

Coding (available options for each model)									
1, 2, 3, 4 and 5	6	7	8	9	10	11.1	11.2	12	13
CFW500C01P7T5	DB	20 or N1	Blank	Blank	Blank	Blank or H00	Blank or EC	Blank or Sxx	Blank
CFW500C03P0T5									
CFW500C04P3T5									
CFW500C07P0T5									
CFW500C10P0T5									
CFW500C12P0T5									

SECTION 2: ELECTRICAL PACKAGE

Specification

CFW500 IP20 or NEMA type 1 - 200-240 V

CFW500 variable speed drive						Maximum applicable motor[1)]									
						Normal duty (ND)					Heavy duty (HD)				
Reference	Power supply (V)		Frame size	Rated current (A)		IEC				UL	IEC				UL
						60 Hz		50 Hz		60 Hz	60 Hz		50 Hz		60 Hz
						220 Vac		220 Vac		230 Vac	220 Vac		220 Vac		230 Vac
				ND	HD	HP	kW	HP	kW	HP	HP	kW	HP	kW	HP
CFW500A01P6S2	Single-phase	220-240	A	-	1.6	-	-	-	-	-	0.25	0.18	0.33	0.25	0.33
CFW500A02P6S2				-	2.6	-	-	-	-	-	0.5	0.37	0.75	0.55	0.75
CFW500A04P3S2				-	4.3	-	-	-	-	-	1.0	0.75	1.5	1.1	1.5
CFW500A07P0S2				-	7.0	-	-	-	-	-	2.0	1.5	2.0	1.5	2.0
CFW500B07P3S2			B	-	7.3	-	-	-	-	-	2.0	1.5	2.0	1.5	2.0
CFW500B10P0S2				-	10	-	-	-	-	-	3.0	2.2	3.0	2.2	3.0
CFW500A01P6B2	Single-phase or three-phase		A	-	1.6	-	-	-	-	-	0.25	0.18	0.33	0.25	0.33
CFW500A02P6B2				-	2.6	-	-	-	-	-	0.5	0.37	0.75	0.55	0.75
CFW500A04P3B2				-	4.3	-	-	-	-	-	1.0	0.75	1.5	1.5	1.5
CFW500B07P3B2			B	-	7.3	-	-	-	-	-	2.0	1.5	2.0	1.5	2.0
CFW500B10P0B2				-	10	-	-	-	-	-	3.0	2.2	3.0	2.2	3.0
CFW500A07P0T2	Three-phase		A	-	7.0	-	-	-	-	-	2.0	1.5	2.0	1.5	2.0
CFW500A09P6T2				-	9.6	-	-	-	-	-	3.0	2.2	3.0	2.2	3.0
CFW500B16P0T2			B	-	16	-	-	-	-	-	5.0	3.7	5.5	4.0	5.5
CFW500C24P0T2			C	-	24	-	-	-	-	-	7.5	5.5	7.5	5.5	7.5
CFW500D28P0T2			D	-	28	-	-	-	-	-	10	7.5	10	7.5	10
CFW500D33P0T2				-	33	-	-	-	-	-	12.5	9.2	12.5	9.2	12.5
CFW500D47P0T2				-	47	-	-	-	-	-	15	11	15	11	15
CFW500E56P0T2			E	-	56	-	-	-	-	-	20	15	20	15	20
CFW500F77P0T2			F	77	64	30	22	30	22	30	25	18.5	25	18.5	25
CFW500F88P0T2				88	75	30	22	30	22	30	30	22	30	22	30
CFW500F0105T2				105	88	40	30	40	30	40	30	22	30	22	30
CFW500G0145T2			G	145	115	50	37	50	37	50	40	30	40	30	40
CFW500G0180T2				180	145	60	45	60	45	60	50	37	50	37	50
CFW500G0211T2				211	180	75	55	75	55	75	60	45	60	45	60

Note: 1) The power values for maximum applicable motor shown in the tables above are reference values and valid for WEG motors. IEC motor powers are based on motor WEG four-pole W22 High Effciency IE2 three-phase induction motors with power supply of 220 V, 230 V, 380, 400 V, 525 or 575 V. NEMA motor power are based on WEG four pole W22 Premium. Motor rated currents may vary with speed and manufacturer, therefore, use the motor power ratings above only as a guidance. The proper sizing of the CFW500 to be used must be determined as a function of the rated current of the motor used.

SECTION 2: ELECTRICAL PACKAGE

Specification

CFW500 IP20 or NEMA1 - 380-480 V

CFW500 variable speed drive					Maximum applicable motor[1)]									
					Normal duty (ND)					Heavy duty (HD)				
Reference	Power supply (V)		Frame size	Rated current (A)	IEC				UL	IEC				UL
					60 Hz		50 Hz		60 Hz	60 Hz		50 Hz		60 Hz
					380 Vac		400 Vac		460 Vac	380 Vac		400 Vac		460 Vac
				ND	HD	HP	kW	HP	kW	HP	HP	kW	HP	kW	HP
CFW500A01P0T4	Three-phase	380-480	A	-	1.0	-	-	-	-	-	0.25	0.18	0.5	0.37	0.5
CFW500A01P6T4				-	1.6	-	-	-	-	-	0.5	0.37	0.75	0.55	0.75
CFW500A02P6T4				-	2.6	-	-	-	-	-	1.5	1.1	1.5	1.1	1.5
CFW500A04P3T4				-	4.3	-	-	-	-	-	2.0	1.5	2.0	1.5	3.0
CFW500A06P1T4				-	6.1	-	-	-	-	-	3.0	2.2	4.0	3.0	4.0
CFW500B02P6T4			B	-	2.6	-	-	-	-	-	1.5	1.1	1.5	1.1	1.5
CFW500B04P3T4				-	4.3	-	-	-	-	-	2.0	1.5	2.0	1.5	2.0
CFW500B06P5T4				-	6.5	-	-	-	-	-	3.0	2.2	4.0	3.0	5.0
CFW500B10P0T4				-	10	-	-	-	-	-	5.0	3.7	5.5	4.0	7.5
CFW500C14P0T4			C	-	14	-	-	-	-	-	7.5	5.5	7.5	5.5	10
CFW500C16P0T4				-	16	-	-	-	-	-	10	7.5	10	7.5	10
CFW500D24P0T4			D	-	24	-	-	-	-	-	15	11	15	11	15
CFW500D31P0T4				-	31	-	-	-	-	-	20	15	20	15	25
CFW500E39P0T4			E	-	39	-	-	-	-	-	25	18.5	30	22	30
CFW500E49P0T4				-	49	-	-	-	-	-	30	22	30	22	40
CFW500F77P0T4			F	77	61	50	37	60	45	60	40	30	40	30	50
CFW500F88P0T4				88	73	60	45	60	45	75	50	37	50	37	60
CFW500F0105T4				105	88	75	55	75	55	75	60	45	60	45	75
CFW500G0142T4			G	142	115	100	75	100	75	125	75	55	75	55	75
CFW500G0180T4				180	142	150	110	150	110	150	100	75	100	75	125
CFW500G0211T4				211	180	175	132	175	132	175	150	110	150	110	150

Note: 1) The power values for maximum applicable motor shown in the tables above are reference values and valid for WEG motors. IEC motor powers are based on motor WEG four-pole W22 High Effciency IE2 three-phase induction motors with power supply of 220 V, 230 V, 380, 400 V, 525 or 575 V. NEMA motor power are based on WEG four pole W22 Premium. Motor rated currents may vary with speed and manufacturer, therefore, use the motor power ratings above only as a guidance. The proper sizing of the CFW500 to be used must be determined as a function of the rated current of the motor used.

CFW500 IP20 or NEMA1 - 500-600 V

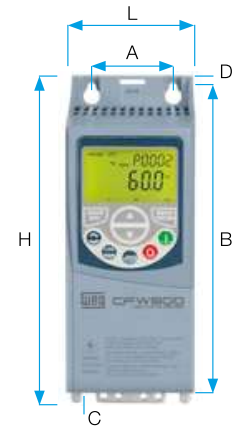
CFW500 variable speed drive					Maximum applicable motor[1)]			
					Heavy duty (HD)			
Reference	Power supply (V)		Frame size	Rated current (A)	IEC		UL	
					60 Hz	60 Hz	60 Hz	
					575 Vac	575 Vac	575 Vac	
				HD	HP	kW	HP	
CFW500C01P7T5	Three-phase	600	C	1.7	1.0	0.75	1.5	
CFW500C03P0T5				3.0	2.0	1.5	2.0	
CFW500C04P3T5				4.3	3.0	2.2	3.0	
CFW500C07P0T5				7.0	5.0	3.7	5.0	
CFW500C10P0T5				10	7.5	5.5	10	
CFW500C12P0T5				12	10	7.5	10	

Note: 1) The power values for maximum applicable motor shown in the tables above are reference values and valid for WEG motors. IEC motor powers are based on motor WEG four-pole W22 High Effciency IE2 three-phase induction motors with power supply of 220 V, 230 V, 380, 400 V, 525 or 575 V. NEMA motor power are based on WEG four pole W22 Premium. Motor rated currents may vary with speed and manufacturer, therefore, use the motor power ratings above only as a guidance. The proper sizing of the CFW500 to be used must be determined as a function of the rated current of the motor used.

SECTION 2: ELECTRICAL PACKAGE

Dimensions and weights

IP20 version



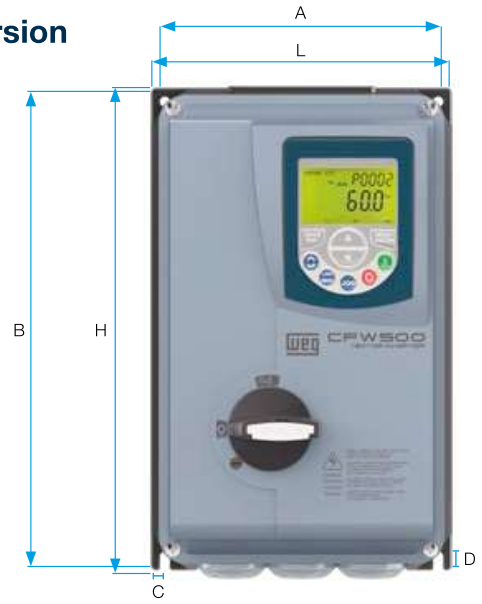
Front view

Side view

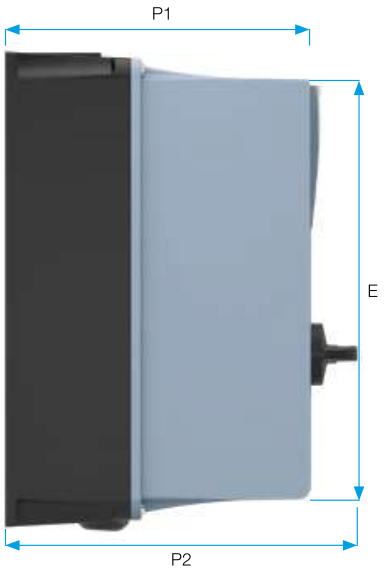
Size	A	B	C	D	H	L	P	Weight
	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	kg [lb]
A	50 [1.97]	175 [6.89]	11.9 [0.47]	7.2 [0.28]	189 [7.44]	75 [2.95]	150 [5.91]	0.8 [1.76]
B	75 [2.95]	185 [7.3]	11.8 [0.46]	7.3 [0.29]	199 [7.83]	100 [3.94]	160 [6.3]	1.2 [2.65]
C	100 [3.94]	195 [7.7]	16.7 [0.66]	5.8 [0.23]	210 [8.27]	135 [5.31]	165 [6.5]	2 [4.4]
D	125 [4.92]	290 [11.41]	27.5 [1.08]	10.2 [0.4]	306.6 [12.1]	180 [7.08]	166.5 [6.55]	4.3 [9.48]
E	150 [5.9]	330 [13]	34 [1.34]	10.6 [0.4]	350 [13.8]	220 [8.7]	191.5 [7.5]	10 [22.05]
F	200 [7.87]	525 [20.67]	42.5 [1.67]	15 [0.59]	550 [21.65]	300 [11.81]	254 [10]	26 [57.3]
G	200 [7.87]	650 [25.59]	57 [2.24]	15 [0.59]	675 [26.57]	335.3 [13.2]	314 [12.36]	52 [114.64]

Note: for the dimensions in the NEMA type 1 version, refer to the user manual.

IP66 version



Front view



Side view

Size	A	B	C	D	E	H	L	P		Weight
								P1	P2	
	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	mm [in]	kg [lb]
A	150 [5.9]	250 [9.83]	5.7 [0.22]	7.5 [0.3]	225 [8.86]	265 [10.43]	165 [6.5]	227 [8.93]	252.5 [9.94]	5.97 [13.16]
B	200 [7.86]	325 [12.79]	5.7 [0.22]	7.5 [0.3]	300 [11.82]	340 [13.39]	215 [8.46]	227 [8.93]	252.9 [9.96]	8.54 [18.82]
C	205.5 [8.08]	464.6 [18.28]	5.7 [0.22]	7.5 [0.3]	416 [16.41]	474 [18.66]	320 [12.6]	289.6 [11.4]	314.6 [12.39]	19.20 [42.32]

Notes: P1 = Measure without disconnect switch.
P2 = Measure with disconnect switch.

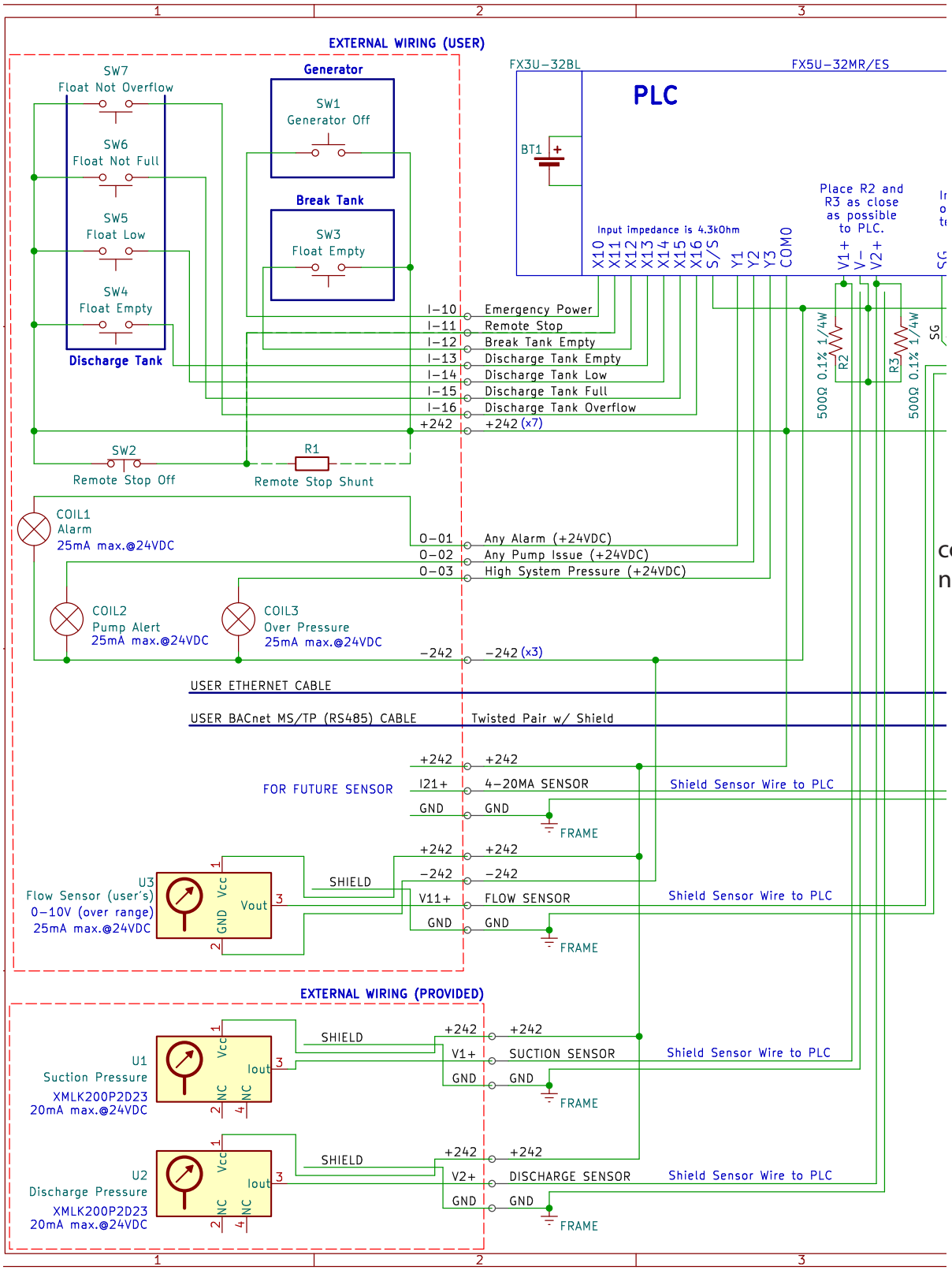
SECTION 2: ELECTRICAL PACKAGE

Standards

Standards	Safety standards	UL 508C - Power conversion equipment
		UL 840 - Insulation coordination including clearances and creepage distances for electrical equipment
		EN 61800-5-1 - Safety requirements electrical, thermal and energy
		EN 50178 - Electronic equipment for use in power installations
		EN 60204-1 - Safety of machinery. Electrical equipment of machines. Part 1: general requirements Note: In order to have a machine in accordance with this standard, the manufacturer of the machine is responsible for installing an emergency stop device and a device for disconnection from the power line
		EN 60146 (IEC 146) - Semiconductor converters
		EN 61800-2 - Adjustable speed electrical power drive systems - Part 2: general requirements - Rating specifications for low voltage adjustable frequency AC power drive systems
	Electromagnetic compatibility standards	EN 61800-3 - Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test methods
		EN 55011 - Limits and methods of measurement of radio disturbance characteristcs of industrial, scientific and medical (ISM) radio-frequency equipment
		CISPR 11 - Industrial, scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement
		EN 61000-4-2 - Electromagnetic compatibility (EMC) - Part 4: testing and measurement techniques - Section 2: electrostatic discharge immunity test
		EN 61000-4-3 - Electromagnetic compatibility - Part 4: testing and measurement techniques - Section 3: ratiated, radio-frequency, electromagnetic field immunity test
		EN 61000-4-4 - Electromagnetic compatibility - Part 4: testing and measurement techniques - Section 4: electrical fast transient/burst immunity test
		EN 61000-4-5 - Electromagnetic compatibility - Part 4: testing and measurement techniques - Section 5: surge immunity test
		EN 61000-4-6 - Electromagnetic compatibility - Part 4: testing and measurement techniques - Section 6: immunity to conducted disturbances, induced by radio-frequency fields
	Mechanical construction standards	EN 60529 - Degrees of protection provided by enclosures (IP code)
		UL 50 - Enclosures for electrical equipment
		IEC 60721-3-3 - Classification of environmental conditions - Part 3: classification of groups of environmental parameters and their severities - Section 3: stationary use at weather protected locations level 3M4.

1160 Cranston Street, Cranston, RI | 401-942-8000

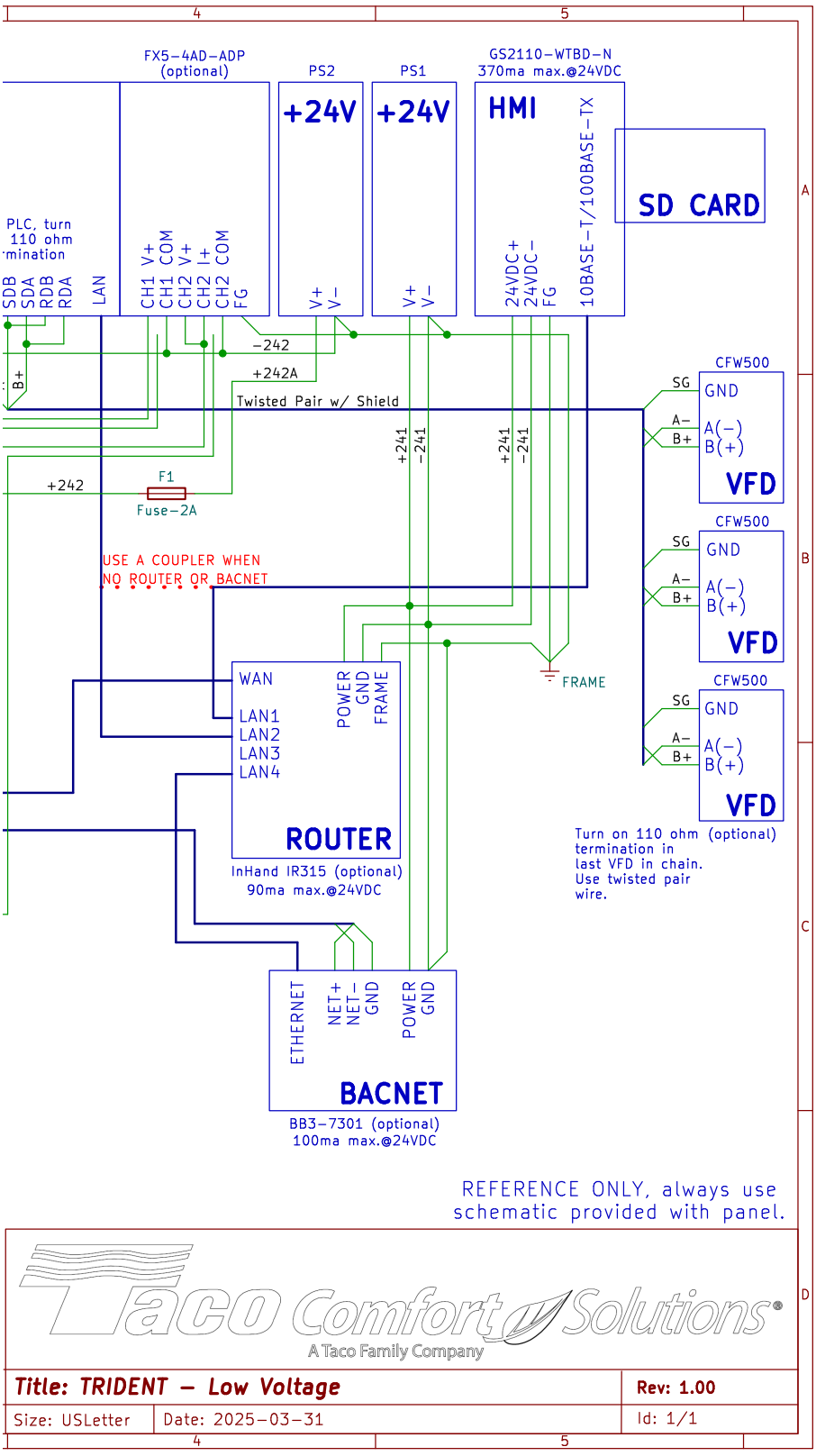
SECTION 3: ELECTRICAL SCHEMATICS



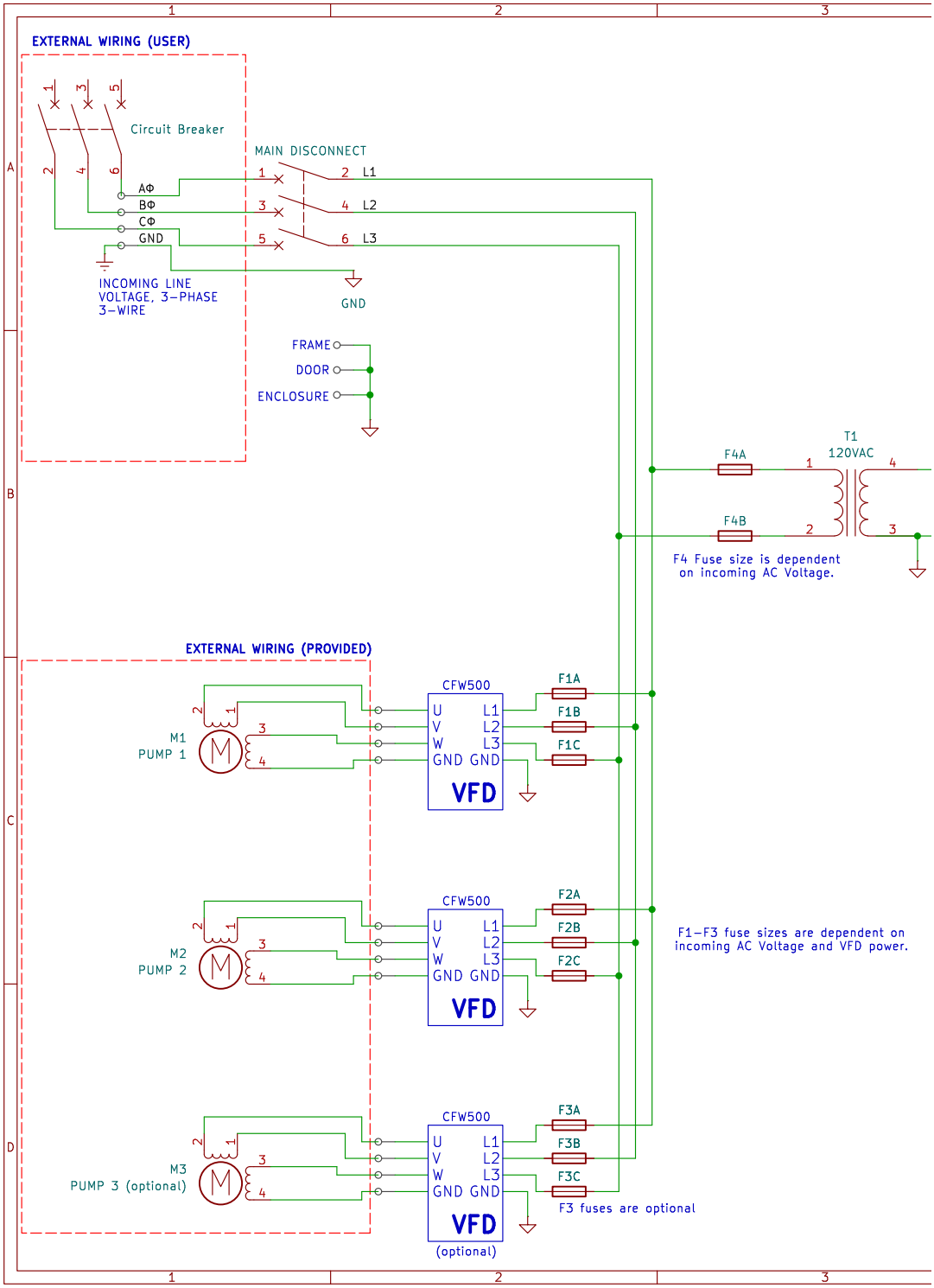
continued on next page

SECTION 3: ELECTRICAL SCHEMATICS

continued from previous page



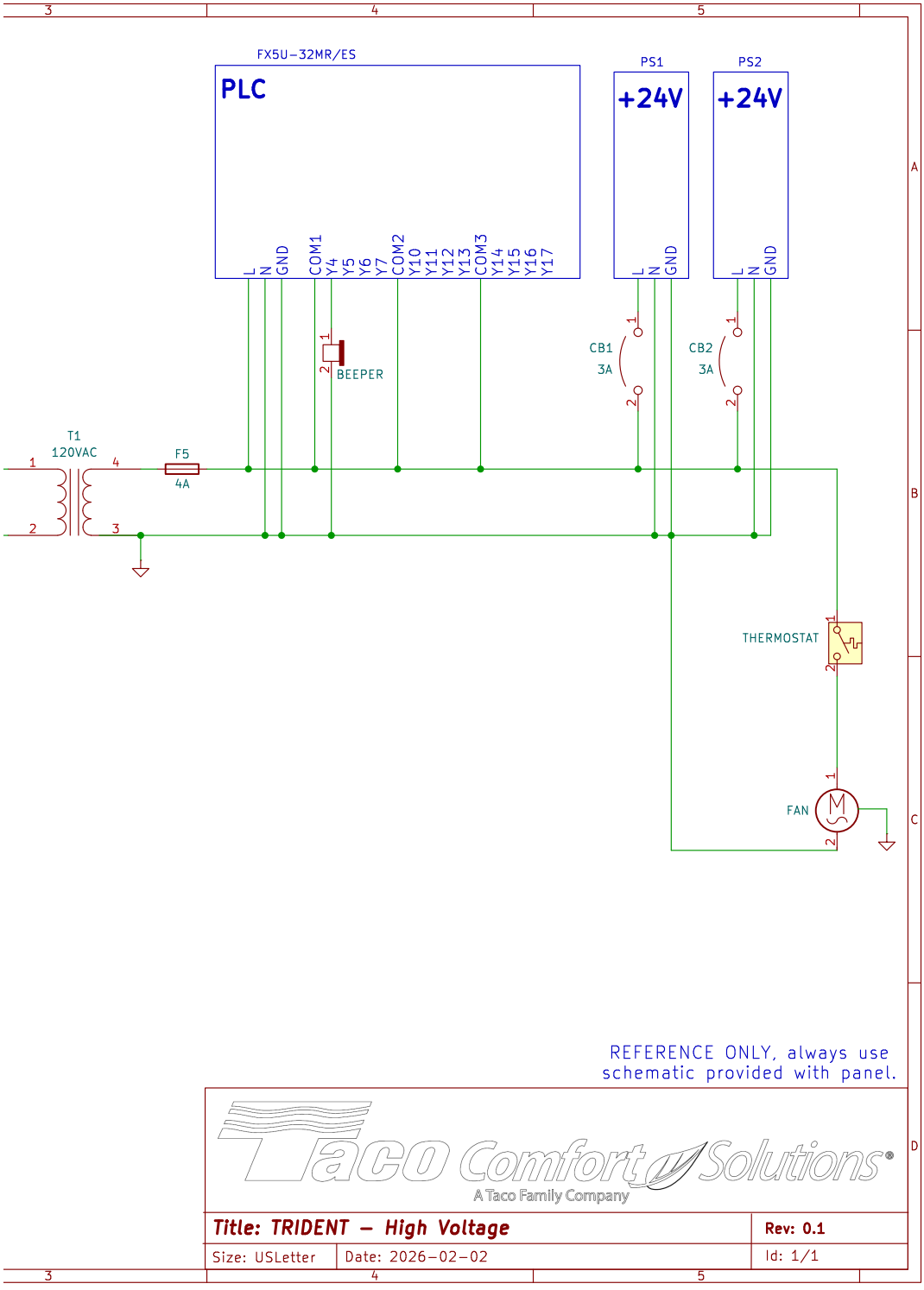
SECTION 3: ELECTRICAL SCHEMATICS



continued on next page

SECTION 3: ELECTRICAL SCHEMATICS

continued from previous page



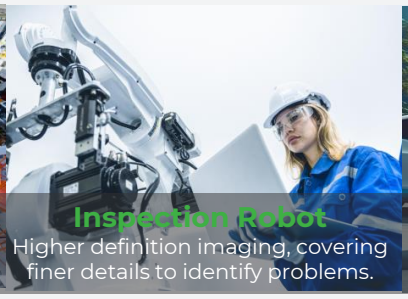
InHand Networks

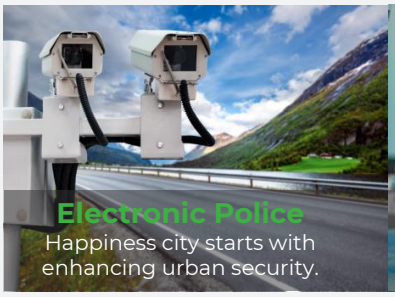
Compact Industrial LTE Router

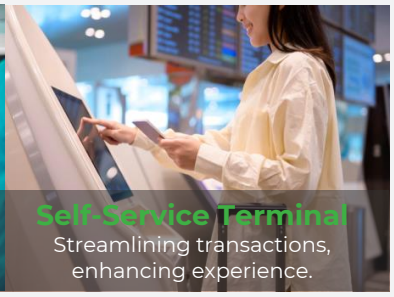
InRouter315

· 5G/4G · Wi-Fi · Security
· Cloud-Managed · Rich Industrial Interfaces

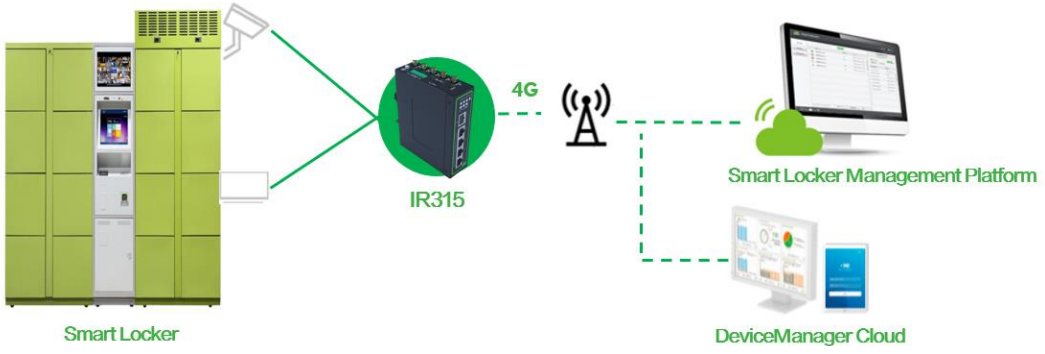
The IR315 is an IoT cellular router that integrates 5G/4G LTE, Wi-Fi, and VPN technologies to provide easy, reliable, and secure Internet connectivity. With features such as 4G wireless wide area network and Wi-Fi wireless local area network, it offers uninterrupted access to multiple networks. With comprehensive security and intelligent software services, it enables efficient and secure networking, providing enterprises with safe and reliable data links for digital networking.







Solution



1160 Cranston Street, Cranston, RI | 401-942-8000

Features and Advantages

Diverse access methods covering all scenarios

IR315 has the capability to access the Internet through cellular, wired, and Wi-Fi connections, catering to different network environments. It provides differentiated cellular network services based on varying business requirements.

"Always-on" connectivity

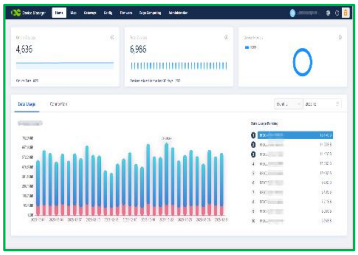
The IR315 comes with Cellular/wired/Wi-Fi backup, cellular link failover, dual SIM switching, VRRP, multi-layer detection mechanism, and other features, providing a reliable and robust connection to ensure your network stability and reliability.

Secure Network Connection

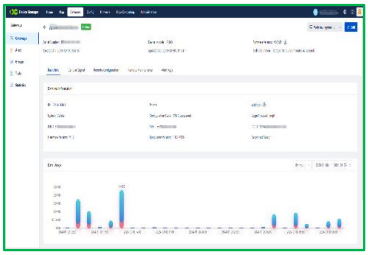
The IR315 is equipped with firewall policies, access control, built-in VPN, data encryption, enhanced Wi-Fi security, and other features, effectively ensuring the security of the network.

Device Manager-Cloud management

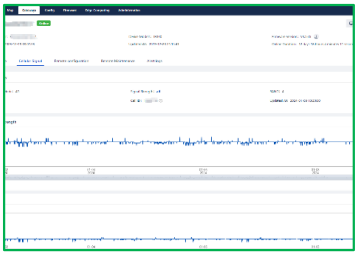
The IR315 connects to the InHand Device Manager remote device management cloud platform to manage tens of thousands of distributed site devices in real time and grasp device status anytime and anywhere, making management more economical and more efficient!



Take Control

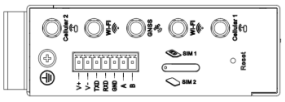


Real-time Monitoring

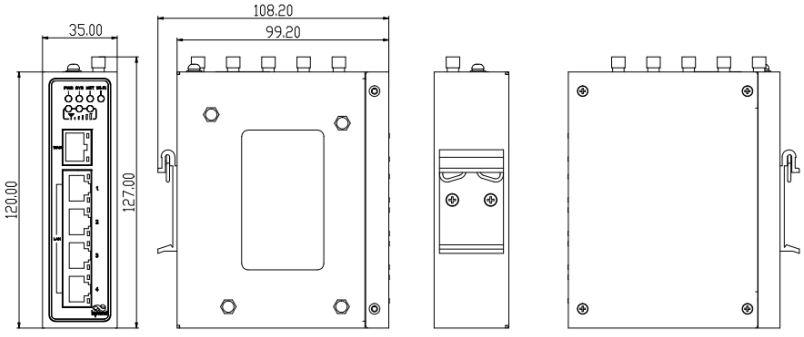


Critical Status

Dimensions (mm)



Industrial Terminal						
IR315						
V+	V-	DIO1	DIO2	COM	DIO3	DIO4
Power Supply		IO				
IR315-S						
V+	V-	TXD	RXD	GND	A	B
Power Supply		RS232			RS485	



Dimensions: 127x 108.2x 35(mm)

InHand Networks

1160 Cranston Street, Cranston, RI | 401-942-8000

Product Specifications

InRouter315 Hardware Specifications			
Hardware Platform			
CPU	580MHz		
RAM	128MB		
FLASH	64MB SPI		
Interface			
Ethernet Port	5*10/100Mbps fast Ethernet port, RJ45, WAN/LAN/VLAN port, 1.5KV network isolation transformer protection		
Power Supply	DC9-36V, over-current protection, anti-reverse connection, 2 PIN industrial terminal		
IO (Optional)	Support 4 x IO (DO or IO can be configured)		
Serial port (Optional)	1 x RS232 + 1 x RS485 ESD protection: 15KV		
*Alternatives for I/O or Serial port			
Reset	Pinhole reset button		
SIM Card	1 x Drawer-type slot, support dual-NANO SIM		
Wi-Fi (Optional)	IEEE 802.11b/g/n, 300Mbps		
GNSS (Optional)	Support GPS/ GLONASS /BeiDou /Galileo/ QZSS Positioning accuracy is 2.5 meter		
Antenna Connector	2 x SMA for LTE 2 x RP-SMA for Wi-Fi 1 x SMA for GNSS		
Ground Terminal	Supports		
Mechanical Specs			
Dimensions	127x 108.2x 35mm	Weight	454g
Installation	Din-rail, wall mounting	Protection Rating	IP30
Housing	Metal	Cooling	Fanless
Power rate			
Standby power	120mA-200mA@12V		
Working power	150mA-320mA@12V		
Peak power	320mA@12V		
Wi-Fi Transmit Power			
Transmit Power	802.11b:16dBm+/-2dBm(11Mbps) 802.11g:16dBm+/-2dBm(54Mbps) 802.11n@2.4GHz:16dBm +/-2dBm(HT20MCS7) 802.11n@2.4GHz:16dBm +/-2dBm(HT40MCS7)		
Ambient Environment			
Storage Temperature	-40 ~ 85℃	Operating Temperature	-20~ 70℃
Ambient Humidity	5~95% (no condensing)		
Indicator			
LED	Power, System, Cellular, Wi-Fi Signal		
EMC			
Static	EN61000-4-2, level 3		
Radiation Electric Field	EN61000-4-3, level 3		
Pulsed Electric Field	EN61000-4-4, level 3		
Surge	EN61000-4-5, level 3		
Conducted Disturbance Immunity	EN61000-4-6 ,level 3		
Shock Wave Resistance	EN61000-4-12,level 3		
Power Frequency Magnetic Field Resistance	EN61000-4-8, horizontal / vertical 400A/m (>level 2)		
Physical Specs			
Shockproof	IEC60068-2-27	Vibration Resistance	IEC60068-2-6
Free Fall	IEC60068-2-32		
Certificate			
CE, E-MARK, IMDA, RCM, FCC, IC, PTCRB, Verizon, AT&T, T-Mobile, MIC&JATE, UL, C1D2, IEC 62443-4-2, EN 18031			

Note: The functions marked with * are not available yet.

InRouter315 Software Specifications	
Network Connection	
Network Access	APN, VPDN
Access Authentication	CHAP/PAP
Network Type	GSM/GPRS/EDGE, UMTS/HSPA+/EVDO/TD-SCDMA/, TDD LTE/FDD LTE, 5G SA (Please refer to the Ordering Guide for frequencies)
LAN protocol	ARP, Ethernet
WAN protocol	Static IP, DHCP, PPPoE
Network Protocol	
IP Application	IPv4, Ping, Trace, DHCP Server, DHCP Relay, DHCP Client, DNS relay, DDNS, Telnet, IP Passthrough
IP Routing	Static routing, OSPF dynamic routing
NAT	Supports network address translation
Security	
Network Security	Stateful Packet Inspection (SPI), DoS attack defense; Multicast filter/Ping probe packet, Access Control List (ACL); Content URL filter, port mapping, virtual IP mapping, IP-MAC binding Supports 802.1X
Data Security	Supports PPTP, L2TP, GRE, IPSEC VPN (IKEv1, IKEv2), OPENVPN(Client&Server), DMVPN, WireGuard, ZeroTier Supports CA digital certificate
Reliability	
Hot Backup	VRRP hot backup
Link Detection	Sends heartbeat packets to detect, auto redials when disconnected
Dual SIM Failover	Supports dual SIM failover
Embedded Watchdog	Device runs self-detection, auto recovers from malfunctions
WLAN (Optional)	
Protocol	IEEE 802.11b/g/n
Rate	Up to 300Mbps
Security	Open system, shared key, WPA/WPA2 certification WEP/TKIP/AES encryption
Transmission Distance	80 meters by line of sight (Actual transmission distance depends on environment of the site.)
Intelligence	
Integrated DTU Functions	TCP, UDP transparent transmission mode, TCP Server mode Supports conversion of Modbus RTU to Modbus TCP bridge Supports DCUDP, DCTCP mode Supports DTU status monitoring
Network Management	
QoS Management	Bandwidth limit, IP speed limit
Configuration	Telnet, Web, SSH and console
Update	Web, Device Manager
Log	Local system log, remote log, and serial export of log. Power down saving of important logs.
SMS Functions	Status query, restart
Dial-on-demand	Dial-on-demand, data / SMS activation
Network management	Supports InHand Device Manager, batch management Add the user experience plan to access The InHand Networks cloud platform to enjoy efficient and convenient services
SNMP	SNMP v1/v2c/v3, supports SNMP TRAP
Traffic Management	Supports data traffic threshold, traffic statistics and traffic alarm
Alarm	System restart alarm, LAN port online/offline alarm, data traffic alarm, SIM card failure alarm ,etc.
Maintenance Tools	Ping, route tracking, network speed test
Status Query	System status, modem status, network connection status, and routing status

1160 Cranston Street, Cranston, RI | 401-942-8000

Ordering Guide

Model code: IR315-<WMNN>-<WLAN/NA>-<S/NA>-<G/NA>				
Model	**<WMNN>: Cellular Type & Module**	**<WLAN/NA>: Wi-Fi**	**<S/NA>: Serial/IO**	**G: GNSS**
IR315-FQ58-< WLAN /NA>-<S/NA>	(For Europe & APAC, Australia, New Zealand, CAT 4) FDD: B1/ B3/ B5/ B7/ B8/ B20 /B28 TDD: B38/ B40/ B41 WCDMA: B1/ B5/ B8 GSM: B3/ B8	WLAN: Wi-Fi <NA>: no Wi-Fi	S: 1*RS232+1*RS485 <NA>: 4*IO	NA
IR315-FQ58-WLAN-<S/NA>-G	(For Europe & APAC, CAT 4) FDD: B1/ B3/ B7/ B8/ B20/ B28A TDD: B38/ B40/ B41 WCDMA: B1/ B8 GSM: B3/ B8	WLAN: Wi-Fi	S: 1*RS232+1*RS485 <NA>: 4*IO	G: GNSS
IR315-FQ68-<WLAN/NA>-S	(For Latin America, CAT 4) FDD: B1/B2/B3/B4/B5/B7/B8/B28/B66 TDD: B40 WCDMA: B1/B2/B4/B5/B8 GSM: B2/B3/B5/B8	WLAN: Wi-Fi <NA>: no Wi-Fi	S: 1*RS232+1*RS485	NA
IR315-FQ78-<WLAN/NA>-<S/NA>	(For Australia, Latin America, CAT 4) FDD: B1/ B2/ B3/ B4/ B5/ B7/ B8/ B28 TDD: B40 WCDMA: B1/ B2/ B5/ B8 GSM: B2/ B3/ B5/ B8	WLAN: Wi-Fi <NA>: no Wi-Fi	S: 1*RS232+1*RS485 <NA>: 4*IO	NA
IR315-FQ78-WLAN-G	(For Australia, Latin America, CAT 4) FDD: B1/ B2/ B3/ B4/ B5/ B7/ B8/ B28 TDD: B40 WCDMA: B1/ B2/ B5/ B8 GSM: B2/ B3/ B5/ B8	WLAN: Wi-Fi	<NA>: 4*IO	G: GNSS
IR315-FF39-<WLAN/NA>-<S/NA>	(For North America, CAT 6) LTE FDD: B2/ B4/ B5/ B7/ B12/ B13/ B14/ B17/ B25/ B26/ B29/ B30/ B66/ B71 LTE TDD: B41/ B42/ B43/ B46/ B48 WCDMA: B2/ B4/ B5	WLAN: Wi-Fi <NA>: no Wi-Fi	S: 1*RS232+1*RS485 <NA>: 4*IO	NA
IR315-FF39-WLAN-S-G	(For North America, CAT 6) LTE FDD: B2/ B4/ B5/ B7/ B12/ B13/ B14/ B17/ B25/ B26/ B29/ B30/ B66/ B71 LTE TDD: B41/ B42/ B43/ B46/ B48 WCDMA: B2/ B4/ B5	WLAN: Wi-Fi	S: 1*RS232+1*RS485	G: GNSS
IR315-FQ38-<WLAN/NA>-<S/NA>	(For North America, CAT 4) LTE FDD:B2/ B4/ B5/ B12/ B13/ B17/ B66/ B71 WCDMA: B2/ B4/ B5	WLAN: Wi-Fi <NA>: no Wi-Fi	S: 1*RS232+1*RS485 <NA>: 4*IO	NA
IR315-FQ88-<WLAN/NA>-S	(For Japan, CAT 4) LTE FDD: B1/ B3/ B8/ B18/ B19/ B26 LTE TDD: B41 WCDMA: B1/ B6/ B8/ B19	WLAN: Wi-Fi <NA>: no Wi-Fi	S: 1*RS232+1*RS485	NA
IR315-EN00-<WLAN/NA>-S	NA	WLAN: Wi-Fi <NA>: no Wi-Fi	S: 1*RS232+1*RS485	NA
IR315-LQ20-<WLAN/NA>-S	(For China, CAT4) FDD: B1/ B3/ B5/ B8 TDD: B34/ B38/ B39/ B40/ B41 WCDMA: B1/ B5/ B8 GSM: B3/ B8	WLAN: Wi-Fi <NA>: no Wi-Fi	S: 1*RS232+1*RS485	NA

Example: IR315-FQ58-WLAN: Five Ethernet ports IR315 series cellular router with Wi-Fi, support IPSec / PPTP / L2TP / OPEN VPN.

Note: Users are asked to join InHand User Experience Plan at first time login. If user agreed to join, the router will connect to InHand DeviceManager portal. If users want to disable it, please go to Services->User Experience Plan to change the setting.

About Us

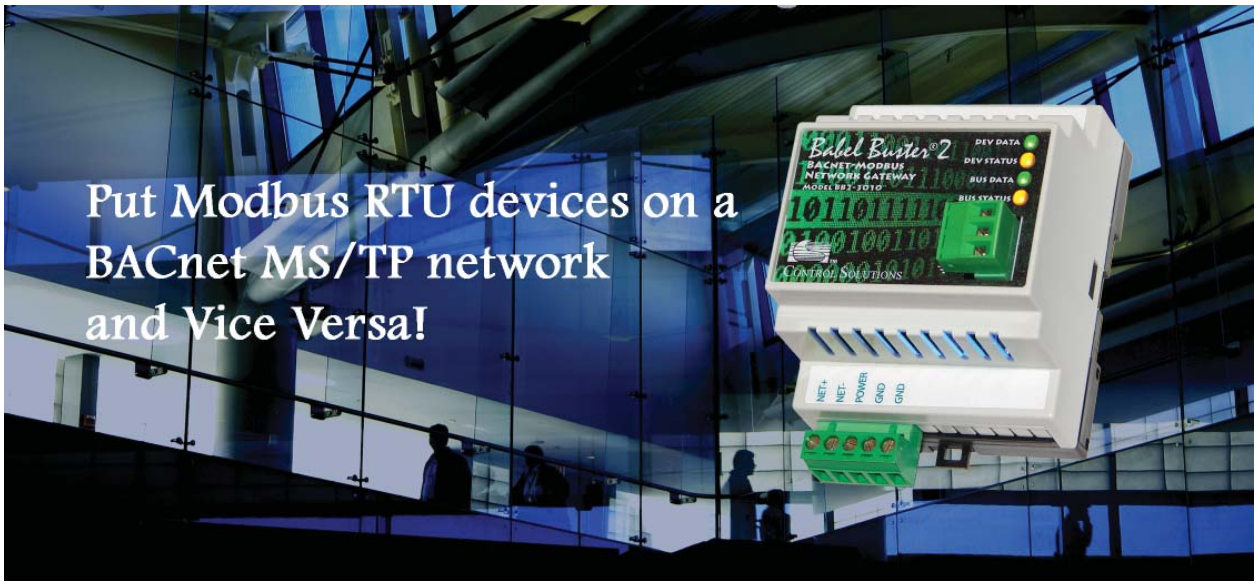
InHand Networks is a leading IoT solutions provider founded in 2001, dedicated to driving digital transformation across industries and empowering customers to unlock their full potential and achieve accelerated growth.

We specialize in delivering industrial-grade connectivity solutions for diverse sectors, such as enterprise networks, industrial and building IoT, digital energy, smart commerce, and mobility. Our comprehensive product portfolio and services cater to various applications worldwide, including smart manufacturing, smart grid, intelligent transportation, smart retail, etc. With a global footprint spanning over 60 countries, we serve customers in China, the United States, France, Germany, the United Kingdom, Italy, and beyond.

InHand Networks

3650 Concorde Pkwy, Suite 200,
Chantilly, VA 20151, USA
T: +1 (703) 348-2988
E: info@inhand.com
www.inhand.com

SECTION 4: OPTIONS



Control Solutions' Babel Buster BB2-3010

is a BACnet MS/TP client/server device that functions as a Modbus RTU master/slave. A large number of BACnet objects gives you flexibility in mapping Modbus registers to any combination of BACnet objects. Packed Modbus registers may be parsed to multiple BACnet objects when reading. Multiple BACnet objects may be packed into a single Modbus register when writing. All standard Modbus register types are supported.

Input objects will poll their assigned Modbus register at the interval you specify, and provide the Modbus data as the Present Value when read. Commandable Output objects are used to write Modbus registers, and will update the Modbus device each time BACnet is updated. The BB2-3010 supports up to 300 non-commandable objects, or up to 135 commandable objects, or a mix in between.

Value objects will poll their assigned Modbus register at the interval you specify. The content of the Modbus register will be given as the Present Value of the BACnet object when read. The Modbus register is written each time the BACnet Value object is written. The Value object corresponds to the Modbus Holding register.

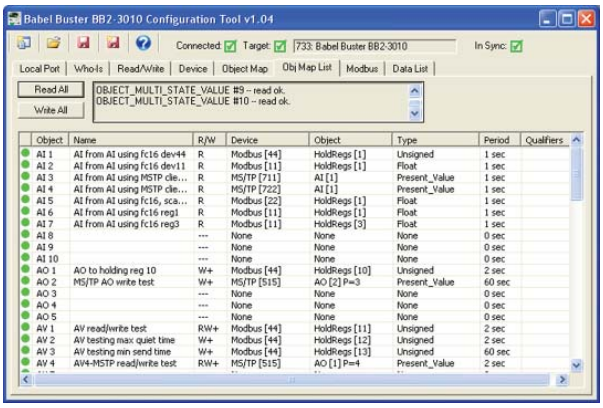
The BB2-3010 is most often used as a Modbus master, but it can operate as a slave while MS/TP operates as a client (master). This makes it possible to put MS/TP devices on a Modbus network (but does still require an understanding of BACnet). MS/TP data in remote devices is queried and saved locally. The local data may then be accessed by another Modbus master.

Babel Buster BB2-3010 Features

- Read/Write any standard Modbus register via BACnet objects
  - 300 Non-commandable objects OR
  - 135 Commandable objects OR
  - Between 135 and 300 objects of mixed types.
  - Object allocations are user configurable
  - AI, AO, AV, BI, BO, BV, MSI, MSO, MSV objects
- COV, COVP subscription support
- BACnet slave is Modbus RTU master or vice versa
- Bidirectional communication between BACnet and Modbus
- Supports Modbus "coils", input registers, holding registers
- Single or double Modbus registers, signed, unsigned, IEEE 754
- Modbus register mapping configured via object properties
- Modbus registers may be scaled (x10, x100, x0.1, x0.01, etc.)
- Modbus (master) polling interval configurable per point
- Commandable BACnet objects implement priority array
- Fully configurable via BACnet object properties
- USB to MS/TP adapter available
- Configuration software included for use with USB adapter
- Hardened EIA-485 transceiver for serial ports
- MS/TP baud rates: 9600, 19200, 38400, 76800
- Modbus RTU baud rates: 4800, 9600, 19200, 38400
- Powered by 12-24V DC/AC 50/60 Hz
- Power Consumption: 0.1A @ 24VDC
- DIN rail mounting, 100mm H x 70mm W x 60mm D
- Pluggable screw terminal blocks
- Operating temperature -40°C to +85°C
- Humidity 5% to 90% non-condensing
- FCC, CE Mark, BTL Listed
- Listed to UL 916 and (Canadian) C22.2 No. 205-M1983

SECTION 4: OPTIONS

PC Based Object Browser for Configuration and Diagnostics



The new MTX002 USB to MS/TP adapter provides a reliable connection between your PC's USB port and MS/TP devices being configured.

The new configuration tool for the BB2-3010 is more powerful and easier to use than any previous tools we have created. We will never be able to completely eliminate gateway setup, but we continue to strive for making it easier.

BACnet Protocol Implementation Conformance Statement (Abbreviated)

Date: 12 January 2012
Vendor Name: Control Solutions, Inc.
Product Name: Babel Buster BB2-3010
Product Model Number: BB2-3010
Applications Software Version: 361
Firmware Revision: 3.61
BACnet Protocol Revision: 7

Product Description: Network gateway allowing Modbus RTU slave devices to be accessed via BACnet MS/TP as a BACnet slave.

BACnet Standardized Device Profile (Annex L):
► *BACnet Application Specific Controller (B-ASC)*

List all BACnet Interoperability Building Blocks Supported (Annex K):
DS-RP-A DS-RP-B DS-RPM-B DS-WP-A DS-WP-B DS-WPM-B DS-COV-B DS-COVP-B DM-DDB-A DM-DDB-B DM-DOB-B DM-DCC-B DM-RD-B DM-R-B

Segmentation Capability:
Segmented requests supported, Window size 16
Segmented responses supported, Window size 16

Standard Object Types Supported:
Object types: AI, AO, AV, BI, BO, BV, MSI, MSO, MSV, DEV (all static)
See additional documentation for optional & proprietary properties.

Data Link Layer Options:
► *MS/TP Master (clause 9), baud rates: 9600, 19200, 38400, 76800*

Device Address Binding:
Is static device binding supported? No
Networking Options: (None)
Character Sets Supported: ANSI X3.4

If this product is a communication gateway, describe the types of non-BACnet equipment/networks(s) that the gateway supports:

Modbus RTU: BACnet slave device functions as Modbus RTU master or slave. Can also function as MS/TP client with Modbus RTU master.

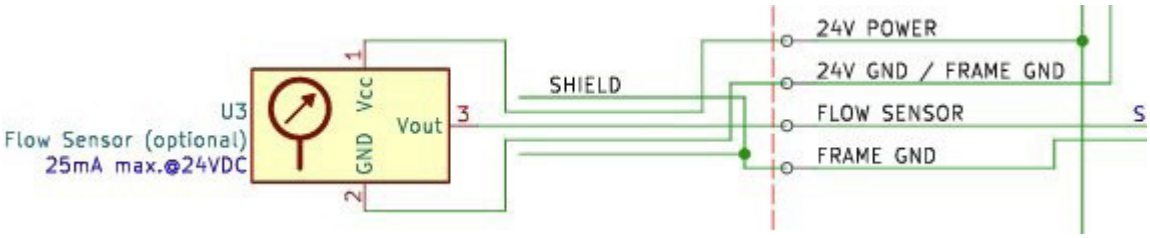
Visit our web site for
- Full details
- User Guides & Software Downloads
- Pricing
- On-Line Ordering

www.csimn.com

Control Solutions Minnesota
PO BOX 10789
ST. PAUL, MN 55110-0789
VOICE (651) 426-4410 • FAX (651) 426-4418
TOLL FREE 1-800-872-8613

SECTION 4: OPTIONS

FLOW SENSOR OPTION: Analog module must be the FX5-4AD-ADP with following wiring instructions:



1160 Cranston Street, Cranston, RI | 401-942-8000

Certificate of Compliance

Certificate Number(s):
UL-US-2585905-0

Report Reference:
E550214-20250923

Issue Date:
2025-09-26

Issued to:

TACO INC
1160 CRANSTON ST, CRANSTON, PROVIDENCE, RI, 02920-7335, US

This certificate confirms that representative samples of:
QCZJ - Packaged Pumping Systems

See Addendum Page for Product Designation(s).

Have been evaluated by UL in accordance with the Standard(s) indicated on this Certificate.

UL 508, Edition 19, Issue Date 2024-10-28
UL 508A, Edition 3, Issue Date 2018-04-24, Revision Date 2025-06-26
UL 778, Edition 6, Issue Date 2016-07-07, Revision Date 2024-07-23

Additional Information:
See UL Product iQ® at https://iq.ulprospector.com for additional information.

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

David Piecuch
UL Mark Certification Program Manager

Form-ULID-019496 – ver 1.0

CERTIFICATE OF COMPLIANCE

Certificate number(s): UL-US-2585905-0
Report reference: E550214-20250923
Issue Date: 2025-09-26

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Packaged Pumping Systems

Model(s): E, D *followed by alphanumeric characters.*

Form-ULID-019496 – ver 1.0

Certificate of Compliance

Certificate Number(s):
UL-CA-2562729-0

Report Reference:
E550214-20250923

Issue Date:
2025-09-26

Issued to:

TACO INC
1160 CRANSTON ST, CRANSTON, PROVIDENCE, RI, 02920-7335, US

This certificate confirms that representative samples of:
QCZJ7 - Packaged Pumping Systems Certified for Canada

See Addendum Page for Product Designation(s).

Have been evaluated by UL in accordance with the Standard(s) indicated on this Certificate.

CSA C22.2 No. 14, Edition 13, Issue Date 2018-03, Revision Date 2022-06
CSA C22.2 NO. 108-14, 5th Ed., Issue Date: 2014-06-01

Additional Information:
See UL Product iQ® at https://iq.ulprospector.com for additional information.

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

David Piecuch
UL Mark Certification Program Manager

CERTIFICATE OF COMPLIANCE

Certificate number(s): UL-CA-2562729-0
Report reference: E550214-20250923
Issue Date: 2025-09-26

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Packaged Pumping Systems

Model(s): E, D *followed by alphanumeric characters.*

Certificate of Compliance

Certificate Number(s):
UL-US-2585905-0

Report Reference:
E550214-20250923

Issue Date:
2025-09-26

Issued to:

TACO INC
1160 CRANSTON ST, CRANSTON, PROVIDENCE, RI, 02920-7335, US

This certificate confirms that representative samples of:
QCZJ - Packaged Pumping Systems

See Addendum Page for Product Designation(s).

Have been evaluated by UL in accordance with the Standard(s) indicated on this Certificate.

UL 508, Edition 19, Issue Date 2024-10-28
UL 508A, Edition 3, Issue Date 2018-04-24, Revision Date 2025-06-26
UL 778, Edition 6, Issue Date 2016-07-07, Revision Date 2024-07-23

Additional Information:
See UL Product iQ® at https://iq.ulprospector.com for additional information.

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

David Piecuch
UL Mark Certification Program Manager

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact UL Solutions Customer Service at https://www.ul.com/contact-us.

CERTIFICATE OF COMPLIANCE

Certificate number	UL-WATER-001032-0
Report reference	MH64050-20251003
Date	2025-10-07

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Packaged Booster Systems

Model(s): Duplex Booster Package - E, Quadraplex Booster Package - E, Simplex Booster Package - E, Triplex Booster Package - E

Certificate of Compliance

Certificate Number:
UL-WATER-001033-0

Report Reference:
MH64050-20251003

Issue Date:
2025-10-07

Issued to:

TACO (CANADA) LTD
UNIT 3
8450 LAWSON RD MILTON, ON L9T 0J8
Canada

This certificate confirms that representative samples of:
FDNP7 - Drinking Water System Components Certified for Canada

See Addendum Page for Product Designation(s).

NSF/ANSI/CAN 61, Issue Date: 2024

Additional Information:
See UL Product iQ® at https://iq.ulprospector.com for additional information.

David Piecuch
UL Mark Certification Program Owner

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact UL Solutions Customer Service at https://www.ul.com/contact-us.

Form-ULID-019496 – ver 1.0

CERTIFICATE OF COMPLIANCE

Certificate number	UL-WATER-001033-0
Report reference	MH64050-20251003
Date	2025-10-07

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Packaged Booster Systems

Model(s): Duplex Booster Package - E, Quadraplex Booster Package - E, Simplex Booster Package - E, Triplex Booster Package - E

Certificate of Compliance

Certificate Number:
UL-WATER-001034-0

Report Reference:
MH64050-20251003

Issue Date:
2025-10-07

Issued to:

TACO (CANADA) LTD
UNIT 3
8450 LAWSON RD MILTON, ON L9T 0J8
Canada

This certificate confirms that representative samples of:
QNVB - Lead Content Verification of Products in Contact with Potable Water

See Addendum Page for Product Designation(s).

NSF/ANSI/CAN 372, Issue Date: 2024

Additional Information:
See UL Product iQ® at https://iq.ulprospector.com for additional information.

David Piecuch
UL Mark Certification Program Owner

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact UL Solutions Customer Service at https://www.ul.com/contact-us.

Form-ULID-019496 – ver 1.0

CERTIFICATE OF COMPLIANCE

Certificate number	UL-WATER-001034-0
Report reference	MH64050-20251003
Date	2025-10-07

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Packaged Booster Systems

Model(s): Duplex Booster Package - E, Quadraplex Booster Package - E, Simplex Booster Package - E, Triplex Booster Package - E

Form-ULID-019496 – ver 1.0

Certificate of Compliance

Certificate Number:
UL-WATER-001034-0

Report Reference:
MH64050-20251003

Issue Date:
2025-10-07

Issued to:

TACO (CANADA) LTD
UNIT 3
8450 LAWSON RD MILTON, ON L9T 0J8
Canada

This certificate confirms that representative samples of:
QNVB - Lead Content Verification of Products in Contact with Potable Water

See Addendum Page for Product Designation(s).

NSF/ANSI/CAN 372, Issue Date: 2024

Additional Information:
See UL Product iQ® at https://iq.ulprospector.com for additional information.

David Piecuch
UL Mark Certification Program Owner

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact UL Solutions Customer Service at https://www.ul.com/contact-us.

Form-ULID-019496 – ver 1.0

CERTIFICATE OF COMPLIANCE

Certificate number	UL-WATER-001035-0
Report reference	MH64050-20251003
Date	2025-10-07

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Packaged Booster Systems

Model(s): Duplex Booster Package - E, Quadraplex Booster Package - E, Simplex Booster Package - E, Triplex Booster Package - E

Form-ULID-019496 – ver 1.0

SECTION 5: WARRANTY

LIMITED WARRANTY STATEMENT

Taco, Inc. will, at the company's option, repair or replace without any TridentBoost component which is proven defective under normal use, either within one (1) year from the date of start-up, or one (1) year and six (6) months from date of shipment, (whichever occurs first).

Motors provided on TridentBoost are not covered by this warranty, and are warranted by the motor manufacturer. For complete details on motor warranty returns, the purchaser should contact the motor manufacturer's local service repair center or contact the motor manufacturer directly. Seals provided on commercial pumps are not covered by these warranty options.

In order to obtain service under this warranty options, it is the responsibility of the purchaser to promptly notify the local Taco stocking distributor and promptly deliver the subject product or part, delivery prepaid, to the stocking distributor. For assistance on warranty returns, the purchaser may contact the local Taco stocking distributor. If the subject product or part contains no defect as covered in this warranty, the purchaser will be billed for parts and labor charges in effect at time of factory examination and repair.

Any Taco product or part not installed or operated in conformity with Taco instructions or which has been subject to misuse, misapplication, the addition of petroleum-based fluids or certain chemical additives to the systems, or other abuse, will not be covered by this warranty.

If in doubt as to whether a particular substance is suitable for use with a Taco product or part, or for any application restrictions, consult the applicable Taco instruction sheets or contact Taco at [401-942-8000].

Taco reserves the right to provide replacement products and parts which are substantially similar in design and functionally equivalent to the defective product or part. Taco reserves the right to make changes in details of design, construction, or arrangement of materials of its products without notification.

TACO OFFERS THIS WARRANTY IN LIEU OF ALL OTHER EXPRESS WARRANTIES. ANY WARRANTY IMPLIED BY LAW INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS IS IN EFFECT ONLY FOR THE DURATION OF THE EXPRESS WARRANTY SET FORTH IN THE FIRST PARAGRAPH ABOVE.

THE ABOVE WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR STATUTORY, OR ANY OTHER WARRANTY OBLIGATION ON THE PART OF TACO.

TACO WILL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF ITS PRODUCTS OR ANY INCIDENTAL COSTS OF REMOVING OR REPLACING DEFECTIVE PRODUCTS.

This warranty gives the purchaser specific rights, and the purchaser may have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts or on the exclusion of incidental or consequential damages, so these limitations or exclusions may not apply to you.

1160 Cranston Street, Cranston, RI | 401-942-8000