

PAGELAND, S.C.

APOLLO

"Apollo" Valves

Manufactured by Conbraco Industries, Inc.
Made In USA

OPERATING INSTRUCTIONS

IF ADDING WATER TO A BOILER, DO NOT ALLOW WATER TO FLOW THROUGH SAFETY VALVE AS SEDIMENT OR DEBRIS MAY BE DEPOSITED ON SEATING SURFACE.

TO ACHIEVE TOPMOST PERFORMANCE AND MAXIMUM SERVICE LIFE, IT IS NECESSARY TO MAINTAIN A PROPER PRESSURE MARGIN BETWEEN THE SET PRESSURE OF THE SAFETY VALVE AND THE EQUIPMENT'S OPERATING PRESSURE.

THE RECOMMENDED PRESSURE DIFFERENTIAL BETWEEN THE PRESSURE RELIEF VALVE SET PRESSURE AND THE BOILER OPERATING PRESSURE SHOULD BE AT LEAST 10 PSI, OR 25% OF THE BOILER OPERATING PRESSURE, WHICHEVER IS GREATER. FAILURE TO MAINTAIN THIS OPERATING MARGIN MAY RESULT IN WATER LEAKAGE PAST THE SEAT AND AN ACCUMULATION OF DEPOSITS ON THE SEATING SURFACE. EXCESSIVE DEPOSITS MAY PREVENT THE VALVE FROM OPERATING PROPERLY, AND A DANGEROUS PRESSURE BUILD-UP AND EQUIPMENT RUPTURE MAY RESULT.

MAINTENANCE AND TESTING

CAUTION! BEFORE TESTING, MAKE CERTAIN DISCHARGE PIPE IS PROPERLY CONNECTED TO VALVE OUTLET AND ARRANGED TO CONTAIN AND SAFELY DISPOSE OF BOILER DISCHARGE (SEE "INSTALLATION INSTRUCTIONS").

UNDER NORMAL OPERATING CONDITIONS A "TRY LEVER TEST" MUST BE PERFORMED EVERY TWO MONTHS. UNDER SEVERE SERVICE CONDITIONS, OR IF CORROSION AND/OR DEPOSITS ARE NOTICED WITHIN THE VALVE BODY, TESTING MUST BE PERFORMED MORE OFTEN. A "TRY LEVER TEST" MUST ALSO BE PERFORMED AT THE END OF ANY NON-SERVICE PERIOD.

TEST AT OR NEAR MAXIMUM OPERATING PRESSURE BY HOLDING THE TEST LEVER FULLY OPEN FOR AT LEAST 5 SECONDS TO FLUSH THE VALVE SEAT FREE OF SEDIMENT AND DEBRIS. THEN RELEASE LEVER AND PERMIT THE VALVE TO SNAP SHUT.

IF LIFT LEVER DOES NOT ACTIVATE, OR THERE IS NO EVIDENCE OF DISCHARGE, DISCONTINUE USE OF EQUIPMENT IMMEDIATELY AND CONTACT A LICENSED CONTRACTOR OR QUALIFIED SERVICE PERSONNEL.

NEITHER CONBRACO INDUSTRIES, INC. NOR ITS AGENTS ASSUME ANY LIABILITY FOR VALVES IMPROPERLY INSTALLED OR MAINTAINED.

DO NOT REMOVE THIS TAG!

WARNING! THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM. CALIFORNIA LAW REQUIRES THAT THIS WARNING BE GIVEN TO THE CONSUMERS IN THE STATE OF CALIFORNIA. FOR MORE INFORMATION VISIT WWW.APOLLOVALVES.COM

THIS PRODUCT MEETS THE REQUIREMENTS OF THE EPA SAFE DRINKING WATER ACT

APOLLO

I-2700-00

INSTALLATION INSTRUCTIONS

MODEL RVW10, RVW30, RVS52, RVS32, & RVW60
(10 SERIES)

1. INSTALLATION MUST BE PERFORMED BY QUALIFIED SERVICE PERSONNEL ONLY.
2. THE BTU/HR OR LB/HR RATING OF THIS VALVE MUST EQUAL OR EXCEED THAT OF THE EQUIPMENT TO WHICH IT IS INSTALLED.
3. DO NOT USE THIS VALVE ON A COAL OR WOOD BOILER HAVING AN UNCONTROLLED HEAT INPUT.
4. INSURE THAT ALL CONNECTIONS, INCLUDING THE VALVE INLET, ARE CLEAN AND FREE FROM ANY FOREIGN MATERIAL.
5. USE PIPE COMPOUND SPARINGLY, OR TAPE, ON EXTERNAL THREADS ONLY.
6. DO NOT USE A PIPE WRENCH! USE PROPER TYPE AND SIZE WRENCH ON WRENCH PADS ONLY.
7. THIS VALVE MUST BE MOUNTED IN A VERTICAL, UPRIGHT POSITION DIRECTLY TO A CLEAN, TAPPED OPENING IN THE TOP OF THE BOILER OR EQUIPMENT. UNDER NO CIRCUMSTANCES SHOULD THERE BE A FLOW RESTRICTION OR VALVE OF ANY TYPE BETWEEN THE SAFETY RELIEF VALVE AND THE PRESSURE VESSEL.
8. WARNING! DURING OPERATION, THIS VALVE MAY DISCHARGE LARGE AMOUNTS OF STEAM AND/OR HOT WATER. THEREFORE, TO REDUCE THE POTENTIAL FOR BODILY INJURY AND PROPERTY DAMAGE, A DISCHARGE LINE MUST BE INSTALLED THAT:
 - A. IS CONNECTED FROM THE VALVE OUTLET WITH NO INTERVENING VALVE AND DIRECTED DOWNWARD TO A SAFE POINT OF DISCHARGE,
 - B. ALLOWS COMPLETE DRAINAGE OF BOTH THE VALVE AND THE DISCHARGE LINE,
 - C. IS INDEPENDENTLY SUPPORTED AND SECURELY ANCHORED SO AS TO AVOID APPLIED STRESS ON THE VALVE,
 - D. IS AS SHORT AND STRAIGHT AS POSSIBLE,
 - E. TERMINATES FREELY TO ATMOSPHERE WHERE ANY DISCHARGE WILL BE CLEARLY VISIBLE AND IS AT NO RISK OF FREEZING,
 - F. TERMINATES WITH A PLAIN END THAT IS NOT THREADED,
 - G. IS CONSTRUCTED OF A MATERIAL SUITABLE FOR EXPOSURE TO TEMPERATURES OF 375°F OR GREATER,
 - H. IS, OVER ITS ENTIRE LENGTH, OF A PIPE SIZE EQUAL TO OR GREATER THAN THAT OF THE VALVE OUTLET.

USE ONLY SCHEDULE 40 PIPE FOR DISCHARGE. (DO NOT USE SCHEDULE 80, PIPE OR CONNECTIONS). DO NOT CAP, PLUG, OR OTHERWISE OBSTRUCT DISCHARGE PIPE OUTLET!

9. SEE APPROPRIATE ASME BOILER AND PRESSURE VESSEL CODE FOR ADDITIONAL INSTALLATION INSTRUCTIONS.

DO NOT REMOVE THIS TAG!

THIS QUALITY CONBRACO SAFETY RELIEF VALVE, ALONG WITH PROPER INSTALLATION, USE AND MAINTENANCE, WILL PROVIDE MANY YEARS OF RELIABLE SERVICE AND PROTECTION AGAINST EXCESSIVE PRESSURE BUILD-UP OF WATER/STEAM. USE OF THIS VALVE FOR ANY OTHER PURPOSE OR MEDIA PLACES ALL RESPONSIBILITY UPON THE USER. BEFORE INSTALLING VALVE, OR OPERATING EQUIPMENT TO WHICH IT IS INSTALLED, READ ALL INSTRUCTIONS CAREFULLY. ALWAYS WEAR PROPER SAFETY EQUIPMENT.



Model RVW10

ASME HOT WATER SAFETY RELIEF VALVE

(10100 Series)

Job Name:	Contractor:
Job Location:	P.O. Number:
Engineer:	Representative:
Tag:	Wholesale Distributor:

DESCRIPTION

ASME Section IV capacity certified bronze safety relief valves for protection of hot water heating boilers, systems and similar equipment.

FEATURES

- ☐ ASME Section IV Certified Capacity (20-60psi only)
- ☐ 15-60 psig (1.4 – 4.1 bar) Set Pressure @ 250°F (121°C) max
- ☐ Corrosion Resistant Construction
- ☐ Male or Female NPT inlet
- ☐ Optional Satin or Polished Chrome Finish
- ☐ MADE IN THE USA

MATERIALS

Body: ASTM B584 Bronze
Nozzle: ASTM B584 Bronze
Spring: Stainless Steel
Seat: EPDM

CAPACITY

National Board Capacity Certified

Set Pressure PSIG (bar)	10-100 (1" Outlet) BTU/Hr
20 (1.38)	545,000
25 (1.72)	625,000
30 (2.07)	710,000
35 (2.41)	790,000
40 (2.76)	870,000
45 (3.10)	955,000
50 (3.45)	1,035,000
55 (3.79)	1,115,000
60 (4.14)	1,200,000

APPROVALS



ASME Section IV Heating Boilers
Canadian Registration Number 0G8547.5C



OPTIONS

CONNECTION

- ☐ Male NPT Inlet ☐ FNPT Inlet

FINISH

- ☐ Brass finish
☐ Polished chrome finish
☐ Satin chrome finish

SEAT

- ☐ EPDM ☐ Silicone

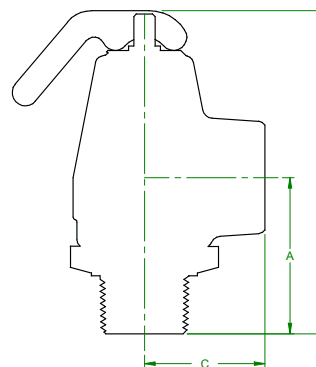
SET PRESSURE

(15-60, psig)

DIMENSIONS

Model No.	Item No.	SIZE	A	B	C
RVW10F	10102	3/4F x 1F	1.50 (38)	3.41 (87)	1.53 (39)
RVW10	10104	3/4M x 1F	1.91 (49)	3.82 (97)	1.53 (39)

All dims in inches (mm)



Conbraco Industries, Inc. 701 Matthews Mint Hill Rd. Matthews NC 28105 USA ; www.Apollovalves.com ; 704-841-6000

This specification is provided for reference only. Conbraco reserves the right to change any portion of this specification without notice and without incurring obligation to make such changes to Conbraco products previously or subsequently sold.



Model RVW60

ASME HOT WATER SAFETY RELIEF VALVE (10600 Series)

Job Name:	Contractor:
Job Location:	P.O. Number:
Engineer:	Representative:
Tag:	Wholesale Distributor:

DESCRIPTION

ASME Section IV capacity certified bronze safety relief valve for protection of hot water heating boilers, systems and similar equipment. It can be pre-set to any pressure ranging from 15 to 160 psig (1 to 11 bar) at 250°F (121°C) max.

FEATURES

- Sizes: 3/4" – 2" (20 – 50mm)
- ASME Section IV Certified Capacity
- Corrosion Resistant Construction
- Diaphragm Isolated Spring Chamber
- Extremely High Capacity
- Directive 97/23/EC (PED) Compliant Option
- MADE IN THE USA

MATERIALS

Body/Cap: ASTM B584 Bronze
Spring: Alloy Steel, plated
Seat: Silicone

CAPACITIES, BTU/HR

ASME HV Rating – 90% of actual capacity at 10% overpressure

RVW60 Standard Discharge Port					
PSIG	3/4" 10604	1" 10605	1-1/4" 10606	1-1/2" 10607	2" 10608
15	541,000	876,000	1,515,000	2,061,000	3,397,000
30	827,000	1,339,000	2,316,000	3,151,000	5,193,000
50	1,209,000	1,956,000	3,384,000	4,604,000	7,589,000
100	2,162,000	3,500,000	6,055,000	8,238,000	13,577,000
125	2,639,000	4,272,000	7,390,000	10,054,000	16,571,000
150	3,116,000	5,044,000	8,725,000	11,871,000	19,565,000

RVW61 High Capacity Discharge Port					
PSIG	3/4" 10614	1" 10615	1-1/4" 10616	1-1/2" 10617	2" 10618
15	635,000	1,027,000	1,777,000	2,417,000	3,984,000
30	970,000	1,570,000	2,716,000	3,696,000	6,091,000
50	1,418,000	2,295,000	3,969,000	5,400,000	8,900,000
100	2,536,000	4,105,000	7,101,000	9,661,000	15,924,000
125	3,096,000	5,011,000	8,668,000	11,792,000	19,435,000
150	3,655,000	5,916,000	10,234,000	13,923,000	22,947,000



Model

☐ Standard Outlet (RVW60) ☐ Oversize Outlet (RVW61)

Size (Inlet)

☐ 3/4" ☐ 1" ☐ 1-1/4" ☐ 1-1/2" ☐ 2"

Set Pressure

psig (15-160)

DIMENSIONS

Series	Size FNPT x FNPT	Height		Width		Weight	
		In.	mm	In.	mm	lbs.	kgs
10604	3/4 x 3/4	5.3	133	3.2	81	2.3	1.1
10614	3/4 x 1						
10605	1 x 1	6.7	170	4.0	102	4.0	1.8
10615	1 x 1-1/4						
10606	1-1/4 x 1-1/4	8.4	213	5.1	129	7.7	3.5
10616	1-1/4 x 1-1/2						
10607	1-1/2 x 1-1/2	10.8	274	5.9	150	11.25	5.1
10617	1-1/2 x 2						
10608	2 x 2	14.0	356	7.2	183	23.5	10.6
10618	2 x 2-1/2						

APPROVALS



ASME Section IV Heating Boilers
Pressure Equipment Directive 97/23/EC (PED)
Canadian Registration Number 0G8547.5C

Conbraco Industries, Inc. 701 Matthews Mint Hill Rd. Matthews NC 28105 USA ; www.apollovalves.com ; 704-841-6000

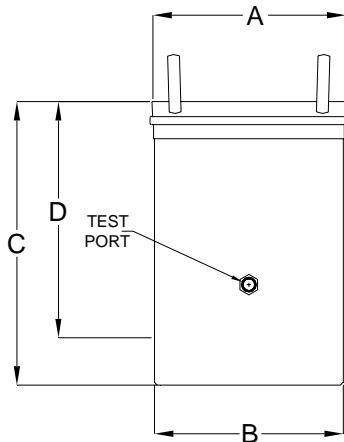
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Saf-T Vent® Appliance Adapters

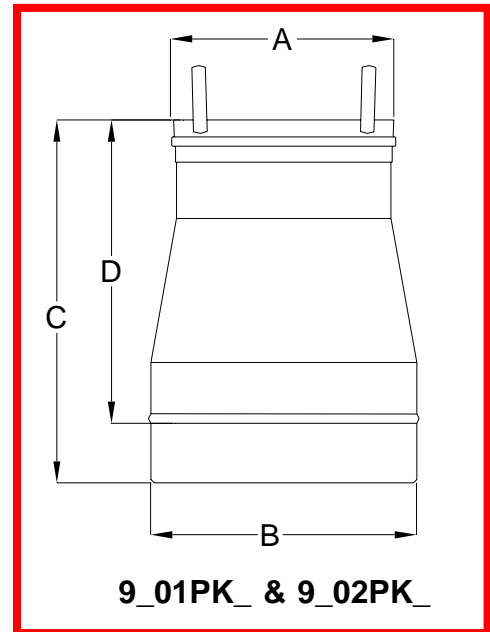
P-K Mach Adapter — These adapters are specially designed to connect directly to the vent outlet of P-K Mach Boilers

Note: Not all adapters are equipped with a test port.

Part Number	DIM - A Nominal Diameter	DIM - B Overall Diameter	DIM-C Installed Length	DIM-D Length
9401MACH	4	3.93	11	9
9501MACH	5	5.14	7	5
9601MACH	6	FACTORY INSTALLED		
9801MACH	8	7.9	12	10
91001MACH	10	9.8	9	7
91002MACH	10	10	9	7
91001PK06	6	9.8	18	16
91002PK06	6	10	18	16
91001PK08	8	9.8	13	11
91002PK08	8	10	13	11



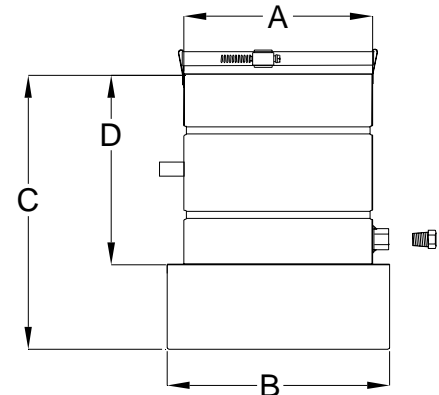
9_01MACH & 91002MACH



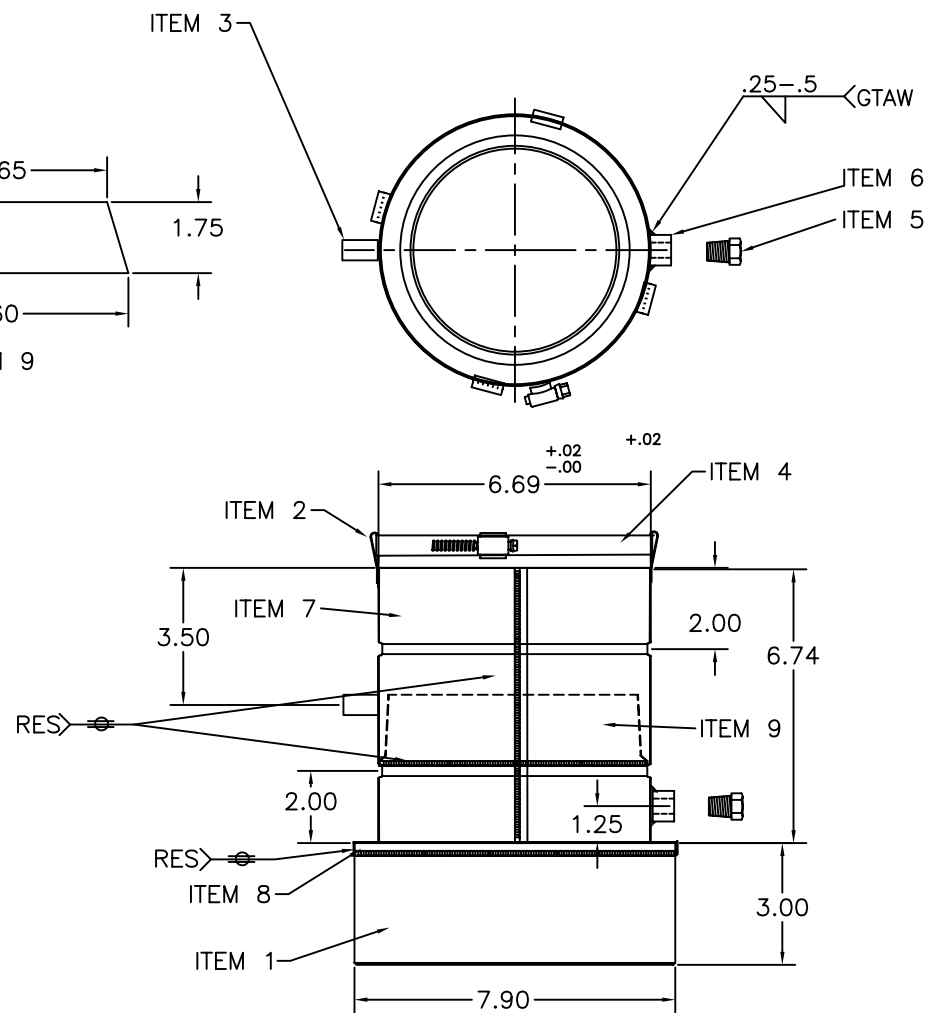
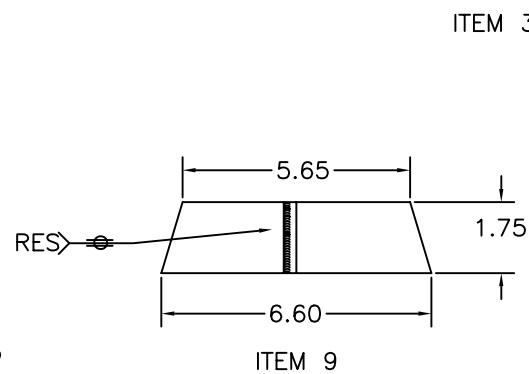
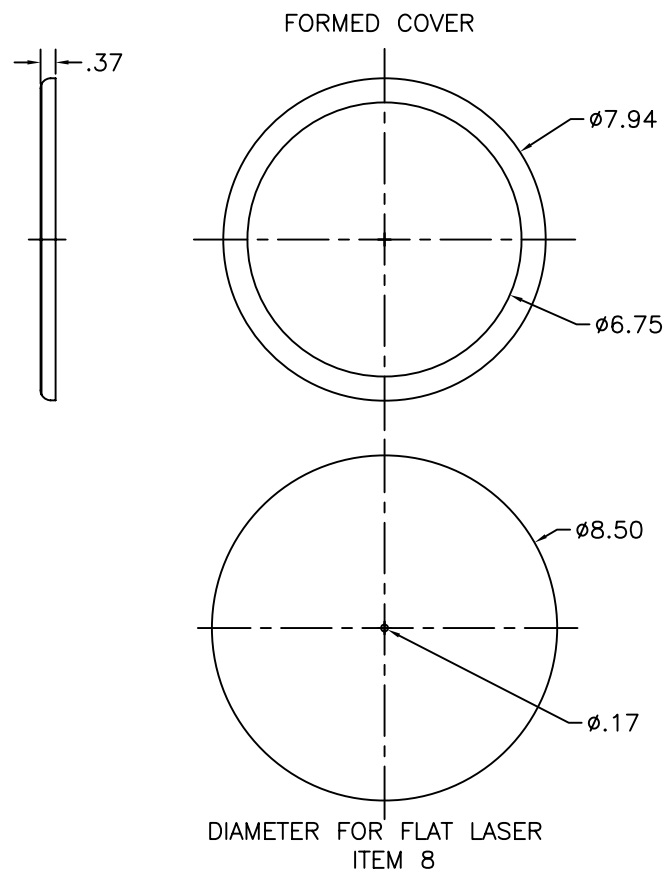
9_01PK_ & 9_02PK_

P-K Mach Adapter — These adapters are specially designed to connect directly to the vent outlet of P-K Mach Boilers and adapt to CPVC venting. Note: Consult local building code when venting with CPVC

Part Number	DIM - A Nominal Diameter	DIM - B Diameter	DIM-C Overall Length	DIM-D Installed Length
9401PKCPVC	4.6	3.9	7	4
9501PKCPVC	6.7	5.14	7	4
9601PKCPVC	6.7	7.9	10	7
9801PKCPVC	8.7	7.9	10	7



9_01PKCPVC

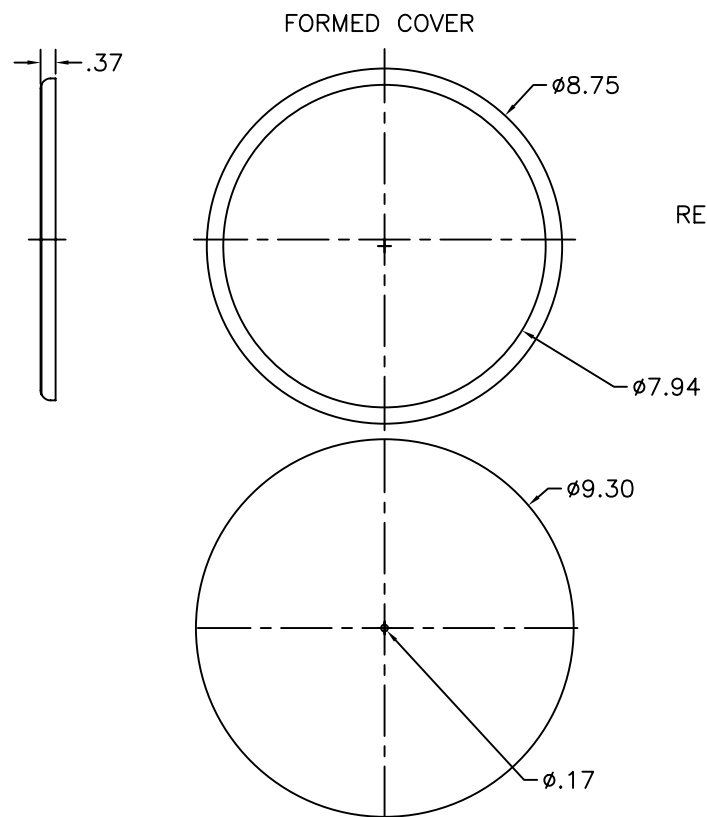


NOTES:

1. ALL O.D. DIMENSIONS ARE BY PI TAPE
2. RTV AROUND DRAIN & TEST PORT A/R
3. RTV AROUND INSIDE EDGE OF COVER

PARTS LIST

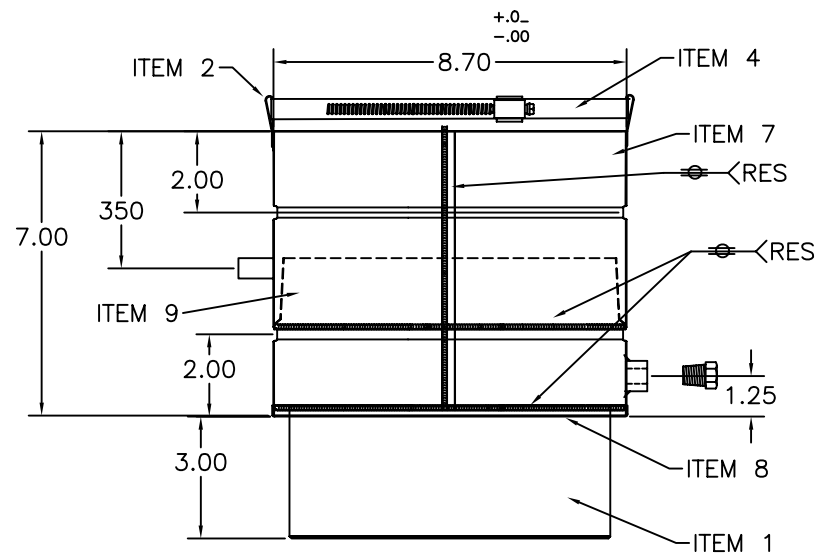
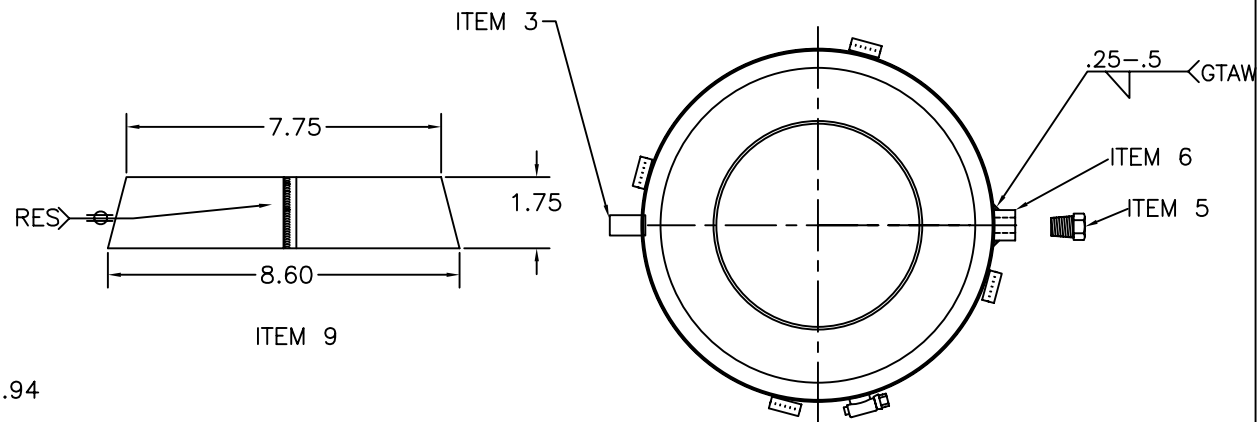
ITEM	PART NUMBER	DESCRIPTION	DIMENSIONS	QTY.
1	IP-V806	EXTENSION	7.90" DIA X 3.25" A/R	
-	7GCTABG	BELTLOOP	SEE PRINT	4
3	AL29TUB2F	.50 DIA. DRAIN	SEE PRINT	1
4	70__-104	HOSE CLAMP	SEE PRINT	1
5	1043	HEX HEAD PLUG	-	1
6	1044	316SS COUPLING	-	1
7	70_OAL_9	6.69 DIA. BODY	.02 X4" X 21.31	1
8	9601PKCV	COVER	SEE PRINT	1
9	9601PKCP	DRAIN INSERT	SEE PRINT	1



DIAMETER FOR FLAT LASER
ITEM 8

NOTES:

1. ALL O.D. DIMENSIONS ARE BY PI TAPE
2. RTV AROUND DRAIN & TEST PORT A/R
3. RTV AROUND INSIDE EDGE OF COVER



PARTS LIST

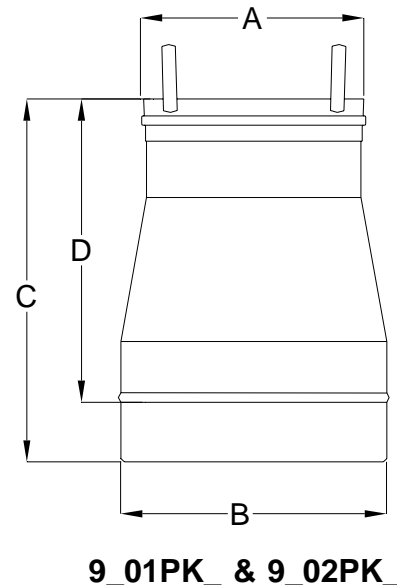
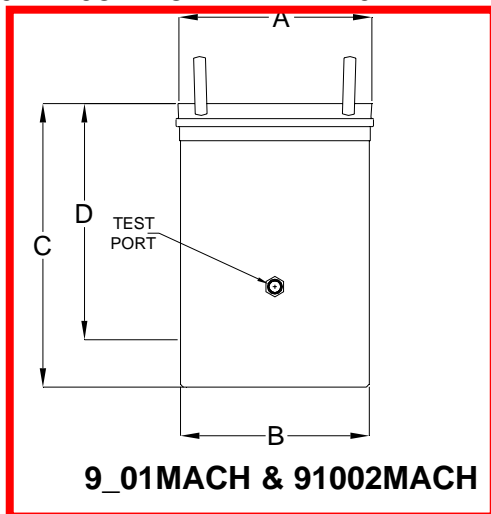
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-	7GCTABG	BELTLOOP	SEE PRINT	4
3	AL29TUB2F	.50 DIA. DRAIN	SEE PRINT	1
4	70__-140	HOSE CLAMP	SEE PRINT	1
5	1043	HEX HEAD PLUG	-	1
6	1044	316SS COUPLING	-	1
7	70_0AL29	6.69 DIA. BODY	.02 X7" X 27.62	1
8	9801PKCV	COVER	SEE PRINT	1
9	9801PKCP	DRAIN INSERT	SEE PRINT	1

Saf-T Vent® Appliance Adapters

P-K Mach Adapter — These adapters are specially designed to connect directly to the vent outlet of P-K Mach Boilers

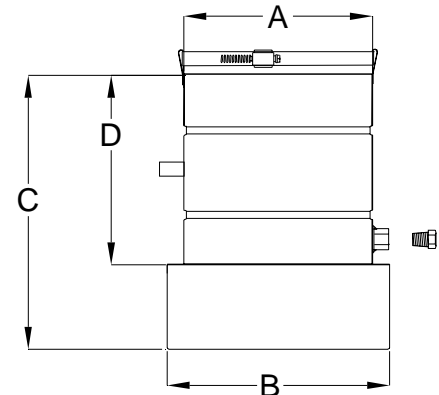
Note: Not all adapters are equipped with a test port.

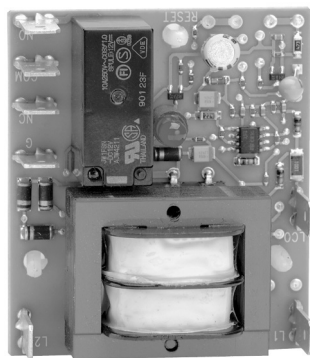
Part Number	DIM - A Nominal Diameter	DIM - B Overall Diameter	DIM-C Installed Length	DIM-D Length
9401MACH	4	3.93	11	9
9501MACH	5	5.14	7	5
9601MACH	6	FACTORY INSTALLED		
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91002PK08	8	10	13	11



P-K Mach Adapter — These adapters are specially designed to connect directly to the vent outlet of P-K Mach Boilers and adapt to CPVC venting. Note: Consult local building code when venting with CPVC

Part Number	DIM - A Nominal Diameter	DIM - B Diameter	DIM-C Overall Length	DIM-D Installed Length
9401PKCPVC	4.6	3.9	7	4
9501PKCPVC	6.7	5.14	7	4
9601PKCPVC	6.7	7.9	10	7
9801PKCPVC	8.7	7.9	10	7





The LLC8 Series is a low cost, single-probe conductive liquid level control designed for low liquid level cutoff protection. It offers a factory fixed time delay of 1 - 60s and is available for input voltages of 24, 120, or 230VAC. LED indicator illuminates whenever the LLC8's isolated, 10A, SPDT output relay is energized. Sense resistance is fixed from 5K - 250K Ω . Available with manual/automatic reset or a special manual reset with a power outage feature that auto resets the unit when power is restored and the water level is acceptable. 24 and 120VAC units are UL recognized as limit switches under UL353 (230VAC units are UL 508) and CSA certified under Standard 14.

For more information see:
Appendix B, page 167, Figure 28 for dimensional drawing.
Appendix C, page 170, Figure 25 for connection diagram.




Operation

Automatic Reset (Reset switch not connected): When liquid rises to low level cutoff probe, output relay and LED indicator energize. When liquid falls below the low level cutoff probe, the output relay and LED indicator de-energize after a fixed time delay.

Manual Reset (Reset switch connected): When the liquid level falls below low level probe, the output relay and LED de-energize after a fixed time delay. When the liquid level rises to low level probe, the output relay and LED indicator remain de-energized until the NC manual reset switch is opened; then they energize immediately.

Power Outage Manual Reset (Reset switch connected): A power outage causes the output relay and LED indicator to de-energize. Upon restoration of power, if the liquid is touching the low level probe, the output relay and LED indicator will re-energize. If the liquid level is below the low level probe, the output relay and LED indicator remain de-energized until the NC reset switch is opened.

Features:

- Designed for low level cutoff protection
 - Energized on wet probe
 - Fixed time delay 1 - 60s
 - Fixed sense resistance of 5K - 250K Ω
 - 24, 120, or 230VAC input voltages available
 - Isolated, 10A, SPDT output contacts
- Approvals:   

Auxiliary Products:

- **Quick connect to screw adaptor:**
P/N: P1015-18
- **Electrode:** P/N: PHST-38QTN
- **Threaded probe (24"):** P/N: LLP-24
- **Female quick connect:**
P/N: P1015-13 (AWG 10/12)
P/N: P1015-64 (AWG 14/16)
P/N: P1015-14 (AWG 18/22)

Available Models:

LLC825F5M	LLC842F26P
LLC843F10M	LLC845F25P
LLC843F10P	LLC8610F12M
LLC843F26M	

If desired part number is not listed, please call us to see if it is technically possible to build.

Order Table:

LLC8	X	X	X	X
Input	Time Delay (fixed)	Sense Resistance	Reset	
2 - 24VAC	Specify fixed delay in seconds (1-60) in 1s increments	F - Fixed (Specify fixed resistance in kilohms (5-250) in 1K increments.)	M - Manual/Automatic Reset	
4 - 120VAC			P - Power outage manual reset	
6 - 230VAC				

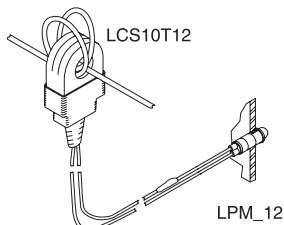
Specifications

Control		Protection	
Type	Resistance sensing for conductive liquids with time delay	Surge	IEEE C62.41-1991 Level A
Sense Voltage	12VAC nominal at probe terminals	Isolation Voltage	\geq 2500V RMS input to output terminals
Sense Resistance	Fixed 5K - 250K Ω	Mechanical	
Sense Resistance Tolerance	\pm 10%	Mounting	0.5 in. (12.7 mm) x 1.87 (4.76 mm) dia. nylon standoffs (3)
Time Delay		Termination	Electrical 0.25 in. (6.35 mm) male quick connect terminals
Tolerance	\pm 20%	Reset Switch & Probe(s)	0.187 x 0.03 in. (4.75 x 0.76 mm) male quick connect terminals
Repeat Accuracy	\pm 10%	Environmental	
Time Delay vs Temp. & Voltage	\pm 10%	Operating / Storage Temperature	-40° to 60°C / -40° to 80°C
Power Outage Reset Delay	\leq 1s	Coating	Printed circuit board is conformal coated to resist moisture & corrosion
Input		Humidity	95% relative, non-condensing
Voltage	24, 120, or 230VAC	Weight	\approx 5 oz (141.7 g)
Tolerance	24VAC -15% - 20% 120 or 230VAC -20% - 10%		
AC Line Frequency	50/60 Hz		
Output			
Type	Electromechanical relay		
Form	Isolated SPDT		
Rating	10A resistive @ 120/240VAC; 1/4 hp @ 125VAC; 1/2 hp @ 250VAC		

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Appendix C - Connection Diagrams

FIGURE 22 - LCS10T12



Wire Length: 500 ft. (152.4m) max. (Customer Supplied)
CAUTION: The LCS10T12 must be connected to the LPM12 or LPMG12 before current flows to prevent damage or shock hazard. Monitored wires must be properly insulated.

FIGURE 23 - LLC1 Series

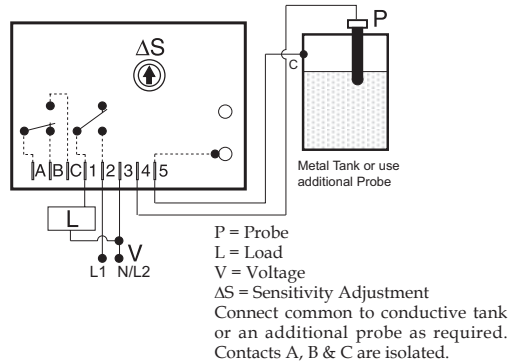


FIGURE 24 - LLC4 Series

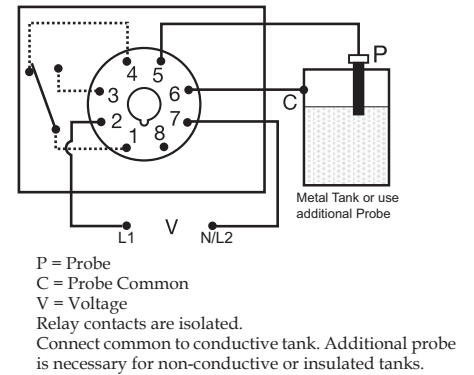
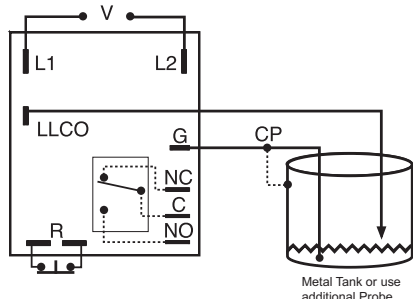


FIGURE 25 - LLC8 Series



V = Voltage
LLCO = Low Level Probe
G or CP = Ground or Common (Reference) Probe
R = Optional NC Reset Switch (not included)
NO = Normally Open
NC = Normally Closed
C = Common or Transfer Contact
Relay contacts are isolated.
Connect common to conductive tank. Additional probe is necessary for non-conductive or insulated tanks.

FIGURE 26 - LLC6 Series

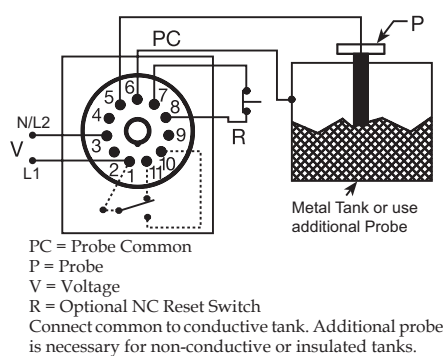


FIGURE 27 - LLC2 Series

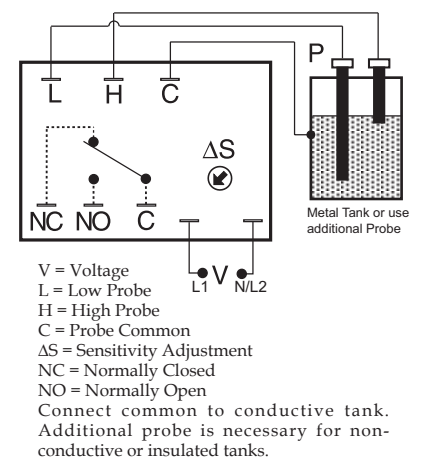
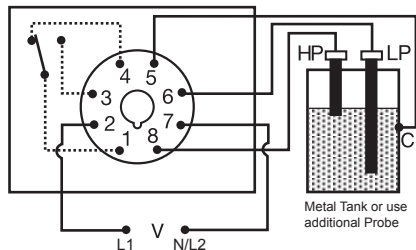
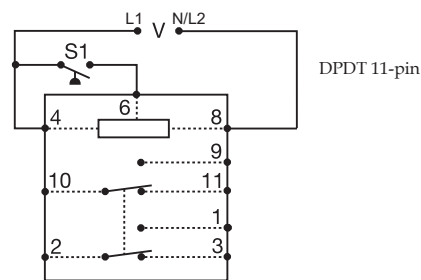
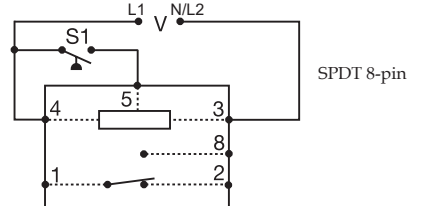


FIGURE 28 - LLC5 Series

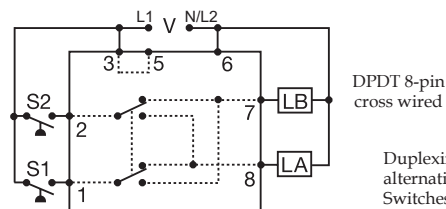


HP = High Level Probe
LP = Low Level Probe
C = Probe Common
V = Voltage
Relay contacts are isolated.
Connect common to conductive tank. Additional probe is necessary for non-conductive or insulated tanks.

FIGURE 29 - ARP Series



Relay contacts in above are isolated.



V = Voltage
LA = Load A
LB = Load B
S1 = Primary Control Switch
S2 = Lag Load Switch

Duplexing (Cross Wired): Duplexing models operate the same as alternating relays and when both the Control (S1) and Lag Load (S2) Switches are closed, Load A and Load B energize simultaneously.

The DPDT 8-pin, cross wired option, allows extra system load capacity through simultaneous operation of both motors when needed. Relay contacts are not isolated.

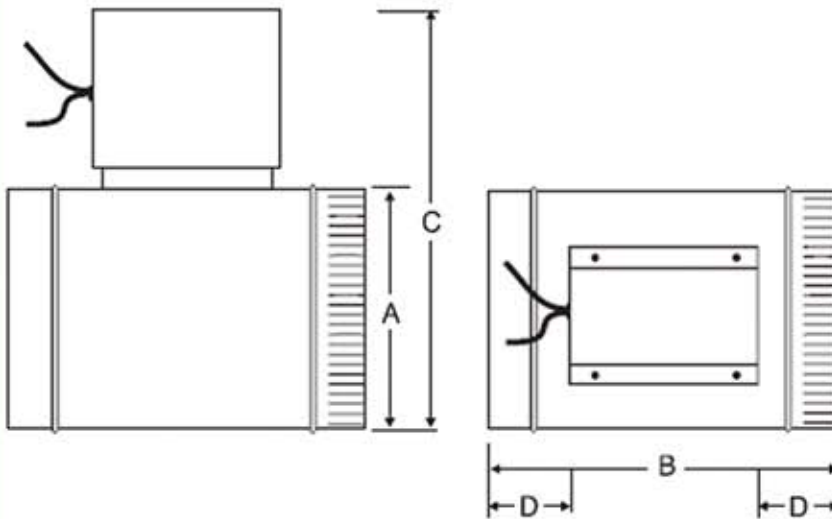


Motorized Damper Category II MACH® Boiler Applications

Flow Control Adjustment

Minimum Flow Adjustment

Minimum flow can be set by loosening the bolt on the shaft and turning the damper from the fully closed position to leave a gap between the gasket and the damper blade. Retighten the bolt with the damper at the desired opening.



Ordering Information					Dimensions			
Model #	Part #	Voltage	End Switch	Damper	A	B	C	D
MD 6"	#23 041	120 V	Yes	Normally Closed	6"	6"	9"	1.38"
MD 8"	#23 045	120 V	Yes	Normally Closed	8"	8"	11"	2.38"
MD 10"	#23 047	120 V	Yes	Normally Closed	10"	10"	13"	3.38"
MD 12"	#23 049	120 V	Yes	Normally Closed	12"	12"	15"	4.38"
MD 14"	#23 051	120 V	Yes	Normally Closed	14"	14"	17"	5.5"

Motorized Damper

Category II MACH® Boiler Applications

Wiring Instructions

Important: Always wire according to local codes.

Damper Wiring Identification

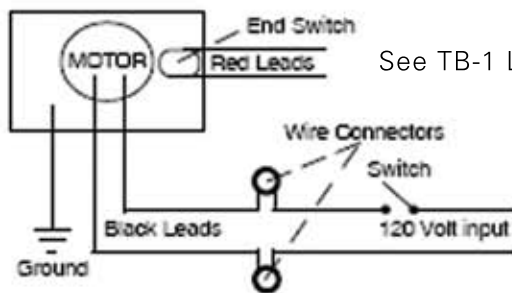
BLACK leads: 120 volt input

GREEN leads: Ground

RED leads: (With end switch only) 120 volt, 10 amps

To Remove/Install Motor Cover

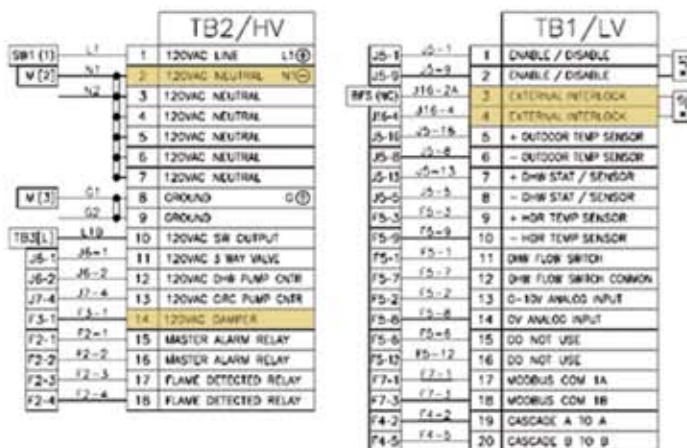
- To remove cover, press in and lift up on end of motor cover with wire hole.
- To install motor cover, place tab on solid end of cover into small slot in motor mount, swing cover over motor and slip second tab into larger slot.



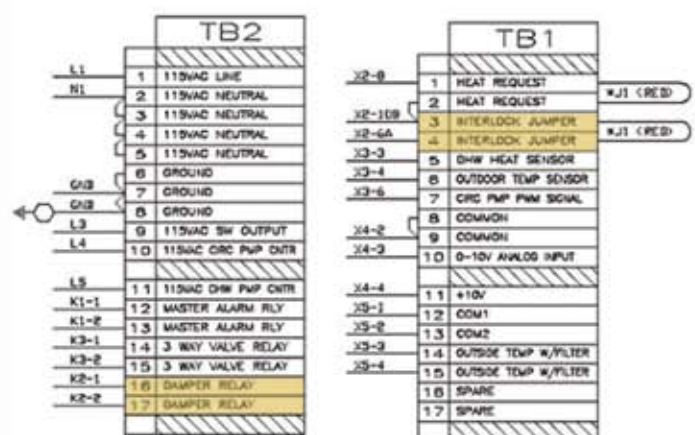
See TB-1 Low Voltage Connections (below)

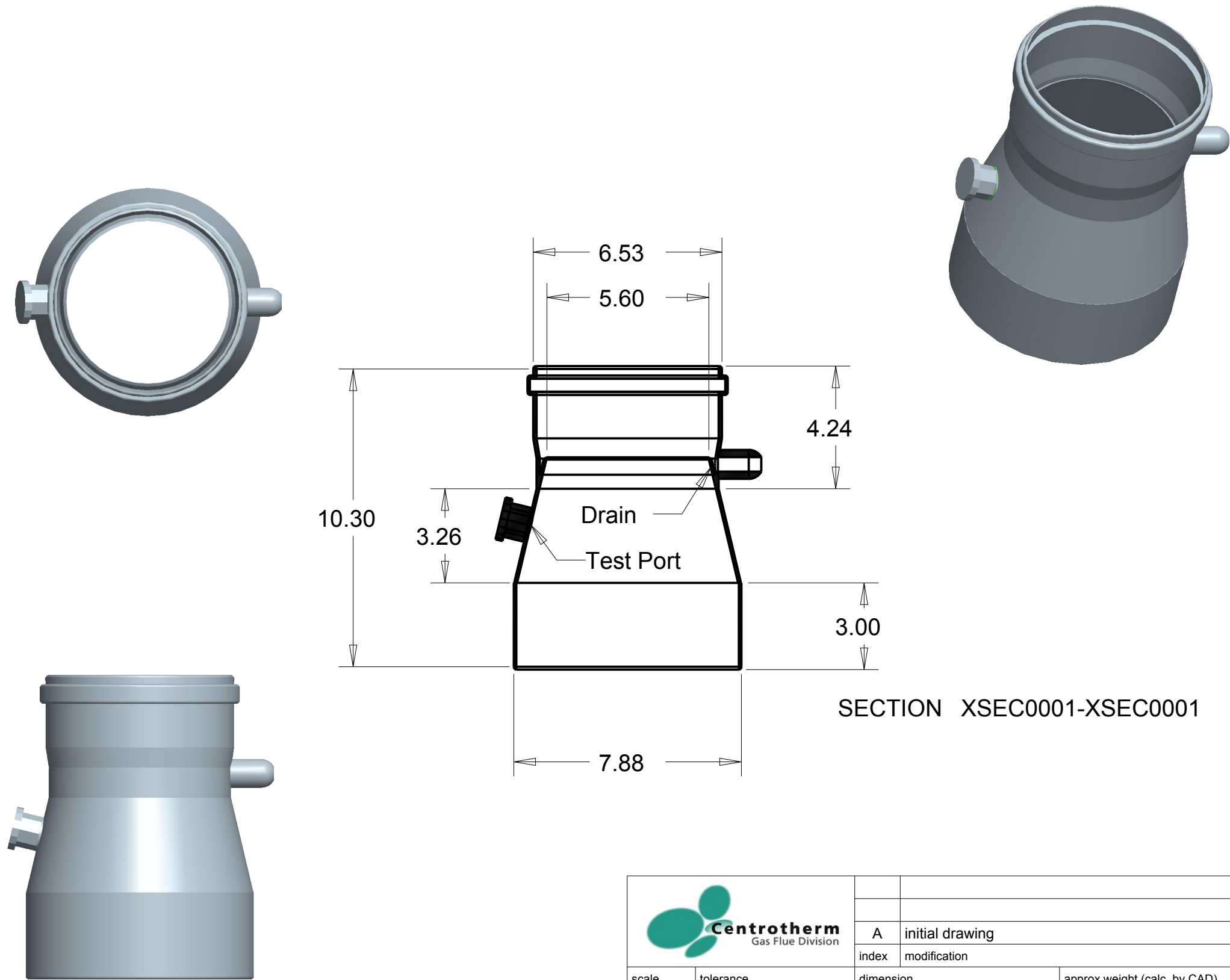
See TB-2 High Voltage Connections (below)


ENVI® Control



MCBA Control





					
		A	initial drawing	Apr-04-13	Cpt
		index	modification	date	ini
scale	tolerance	dimension	approx.weight (calc. by CAD)	approx.volume (calc. by CAD)	
0.250	ISO 2768-m	STD	lbs <input type="checkbox"/>		
model name		material/FMS		date	ini
MACH1050		PPs Grey		production released	
status		drawing number		for test production	
Construction		DRWMACH1050		for quote	
add info		description		approved by	Apr-04-13
		MACH1050		created on	Apr-04-13
		MACH1050		sheet	CpT
				1/1	index
				projection method 3	1

Specification Sheet

Customer: Patterson-Kelley

Part Number: 1003300743

3" Tridicator (temperature/pressure gauge)

Case: Black steel

Bezel: Chrome plated

Case shape: Bowl

Dial: 3"

Lens: Acrylic

Pointers: Black non-adjustable

Connection: Brass NPT fitting. 1/2"NPT center back connection

Bourdon Tube: Phosphor Bronze

Stem: 2"

Temperature Range: 70-320°F/20-160°C

Pressure Range: 0-100psi/kpa

Accuracy: Pressure $\pm 2\%$ of span in middle half of range. $\pm 3\%$ of span elsewhere. Temperature $\pm 3\%$ of span over entire range

Specification Sheet

Customer: Patterson-Kelley

Part Number: 1003300744

3" Tridicator (temperature/pressure gauge)

Case: Black steel

Bezel: Chrome plated

Case shape: Bowl

Dial: 3"

Lens: Acrylic

Pointers: Black non-adjustable

Connection: Brass NPT fitting. 1/2"NPT center back connection

Bourdon Tube: Phosphor Bronze

Stem: 2"

Temperature Range: 70-320°F/20-160°C

Pressure Range: 0-240psi/kpa

Accuracy: Pressure $\pm 2\%$ of span in middle half of range. $\pm 3\%$ of span elsewhere. Temperature $\pm 3\%$ of span over entire range

OUTSIDE / ROOM TEMPERATURE SENSOR

FEATURES

- Wall mounted
- Small design housing
- Easy connecting
- Bottom or back cable entry
- Complete mounting set
- Splash proof
- UV resistant

APPLICATIONS

- HVAC
- Room sensing
- Outside sensing
- Building controls



GENERAL INFORMATION

The Tasseron outside / room sensor measures air temperature indoor or outdoor. The sensor has a solid construction with a white UV resistant plastic cover to minimize solar influence.

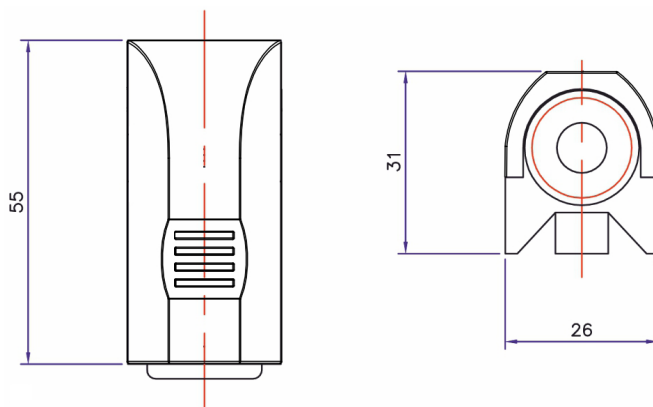
Installation costs are saved using this sensor as it is designed for quick connection and it comes in a complete set for mounting on the wall. The set comes in a little box which includes: the sensor with grommet for cable sealing, screws, wallplug and a mounting instruction.

GENERAL TECHNICAL INFORMATION

Characteristic	Parameter	Value	Unit
Operating temperature	T_{op}	-40...60	°C
Resistance tolerance NTC (@60°C)	ΔR_R	±3	%
Insulation resistance	R_{ins}	>200	MΩ
Test Voltage (t = 1s)	V_{test}	2000	V _{AC}

MEASUREMENTS & MATERIALS

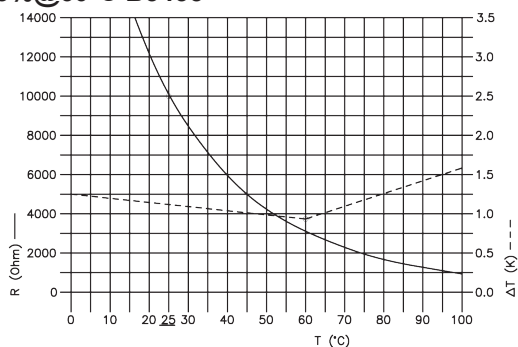
Housing size (l x w x h) : 55 x 26 x 31 mm
Housing material : PC White / Black
Electrical connection : 2 way 0,3 - 1,5 mm²
cable spring connector



AVAILABLE SENSOR VALUES

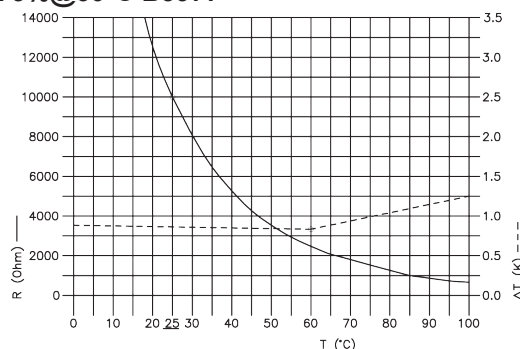
NTC 10K 3%@60°C B3435

T(°C)	Rn(Ohm)
0	27700
5	22290
10	18070
15	14740
20	12110
25	10000
30	8300
35	6924
40	5810
45	4896
50	4147
55	3525
60	3011
65	2582
70	2224
75	1922
80	1668
85	1451
90	1267
95	1110
100	975



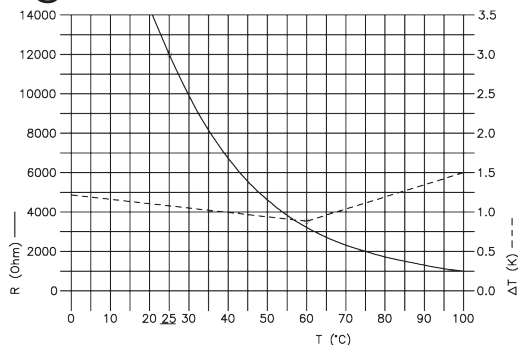
NTC 10K 3%@60°C B3977

T(°C)	Rn(Ohm)
0	32624
5	25381
10	19897
15	15711
20	12493
25	10000
30	8056
35	6530
40	5324
45	4365
50	3599
55	2982
60	2483
65	2079
70	1748
75	1476
80	1252
85	1066
90	912
95	782
100	674



NTC 12K 3%@60°C B3740

T(°C)	Rn(Ohm)
0	36033
5	28562
10	22799
15	18308
20	14796
25	12000
30	9801
35	8060
40	6663
45	5531
50	4615
55	3862
60	3248
65	2749
70	2336
75	1993
80	1707
85	1466
90	1264
95	1095
100	951



ORDERING INFORMATION

Measuring element	Ordering Code
NTC 10K B3435	TSA00AA
NTC 10K B3977	TSA00A1
NTC 12K B3740	TSA00B4

Other measuring elements on request

Packing quantity and MOQ: 144 pieces

Tasseron Sensors B.V.

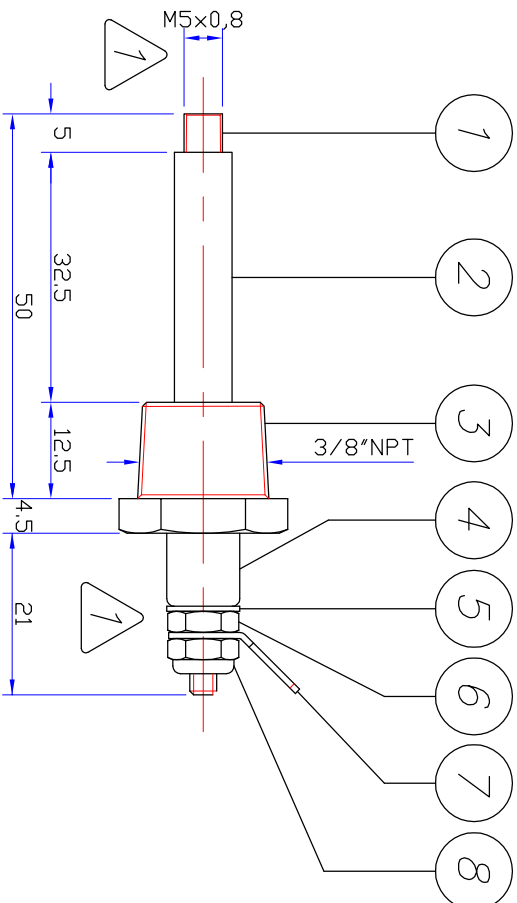
Ambachtshof 50
NL-2632 BB Nootdorp
The Netherlands

Tel: +31 (0)15 310 40 00
Fax : +31 (0)15 310 40 40
Email: sensors@tasseron.nl

Tasseron Sensors Inc.

2401 Reach Road
Williamsport, PA 17701
United States

Tel: +1 (570)601-1971
Fax : +1 (570)601-1972
Email: sales@tasseronusa.com



8	1	AISI 316	LOCK NUT
7	1	NICKEL PL. STEEL	6.3 X 0.8 TAB
6	1	AISI 316	NUT
5	1	AISI 316	WASHER
4	1	CERAMIC	BEADING
3	1	AISI 316	HEX19 PLUG
2	1	DELFIN	PIN ISOLATION
1	1	AISI 316	Ø5 LEVEL PIN
POS.	QTY.	MATERIAL	DESCRIPTION

TALSARON
SENSORS & CONTROLS

WATER CUT-OFF 50MM

—

CHANGE CAD—DRAWING ONLY WITH CAD—SYSTEM

SCALE: 1:1

DIMENSIONS: all units in mm

TOLERANCES: ±0.1mm unless otherwise noted

REV.

DESCRIPTION

DWN

APP RD

APP PRD

DATE

DRAWING NO. TSL050C

A4

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