

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

Designed to provide protection for on-site instrumentation against the effects of climate, dust and dirt, accidental damage, corrosion and tampering, using an integrated enclosure arrangement



FEATURES

- Body and lid in tough glass-filled sheet molded polyester for maximum resistance to extreme temperatures and environmental conditions.
- Optional viewing window allows instrument inspection without opening the enclosure.
- Sealing strip ensures the enclosure is completely weatherproof to IP66.
- Optional 20 mm molded isocyanurate foam insulation provides instrument protection down to -94°F (-70°C).
- Enclosure manifolds designed to mount in the base or back of the enclosure, eliminating the need for internal mounting brackets or pipe stands.
- Process and vent connections made on the outside directly into the manifold, remove the need for internal pipework, compression fittings and bulkheads.
- 2" NB (50 mm) mounting collar with fixing bolt enables easy mounting directly onto a pipe stand.
- Steam or electric heating systems can be custom designed. Precise enclosure temperature can be maintained with a wide range of heating accessories.
- 316 stainless steel fasteners and fittings prevent corrosion in harsh environments.
- Anti static enclosures available to suit specific applications.
- Choice of low or high back-mounted manifold mounting options for instruments above (for liquid applications) or below the manifold (for gas applications).

GENERAL APPLICATION

Enclosure systems are used to protect process instrument manifolds and transmitters, solenoid valves, general field instrumentation and remote chemical sealed instruments from the effects of cold temperature, water deluge, physical damage, environmental conditions and tampering.

TECHNICAL DATA

Materials:	Glass reinforced polyester (GRP)
Sizes (W, H, D)	
5L:	13" x 16.9" x 15.8" (330 x 428 x 400 mm)
15L:	19.7" x 23.6" x 19.5" (500 x 600 x 495 mm)
24L:	31.5" x 23.6" x 19.5" (800 x 600 x 495 mm)
Manifolds:	2, 3, 5 valve
Temperature range:	-94° to +176°F (-70° to +80°C)
Classification:	IP66

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

ENCLOSURE SYSTEMS PRODUCT OVERVIEW

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PRODUCT OVERVIEW

Anderson Greenwood instrument protection systems provide a strong weatherproof barrier for every type of instrument installation, both on and offshore, and have been installed in some of the harshest industrial climates in the world. Instrument enclosures prevent exposure to harmful UV rays and can be supplied for temperatures from -70°F to +176°F (-57°C to +80°C). With a range of three standard sizes of enclosures and a purpose designed range of integrated manifolds, heaters and accessories, this unique system sets the standard in instrument protection.

Enclosures

Manufactured from tough fire retardant GRP, weatherproof to IP66, anti-static and insulated options available.

Manifolds

A complete range of integral base and back-mounted 2, 3, and 5 valve manifolds suitable for liquid and gas services. They allow direct instrument mounting, which eliminates the need for extra bracketing, cuts installation costs and reduces potential leak points.

Markets served

- Oil and gas offshore platforms
- Oil and gas onshore terminals
- Chemical and petrochemical plants
- Steel plants
- Water treatment
- Power generation
- Food and beverage processing
- Paper mills
- OEMs
- Gas metering skid manufacturers

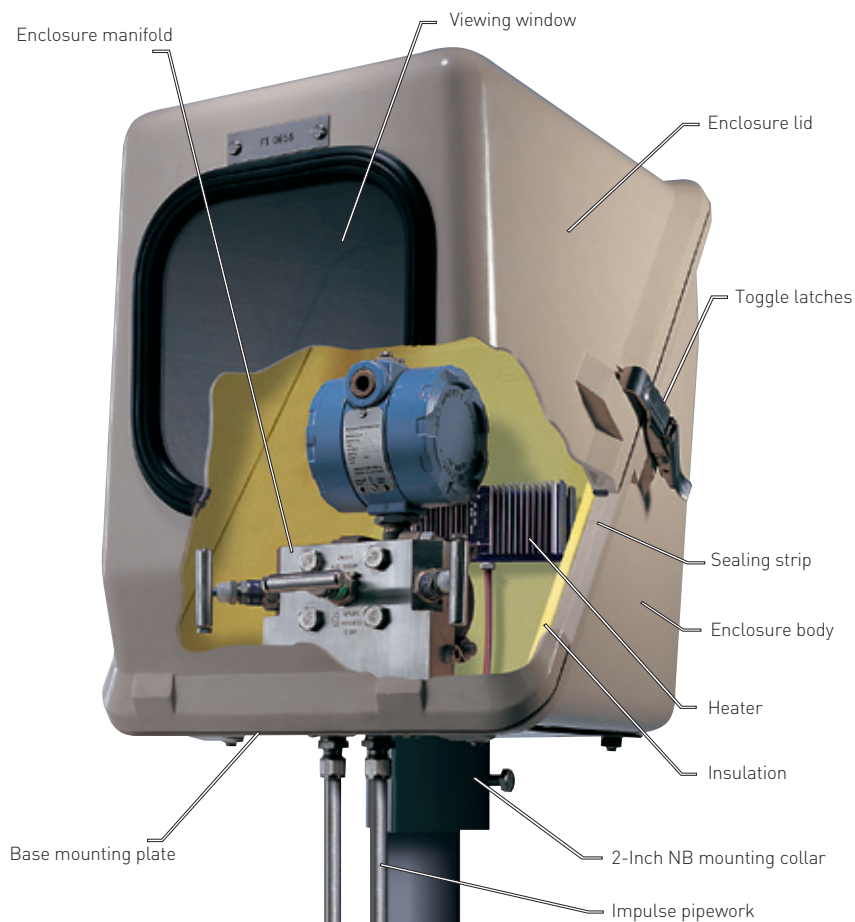
ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

TECHNICAL SPECIFICATION

L type enclosure systems are available in a wide range of sizes to protect single or multiple instrument applications. Produced from fire retardant GRP, they feature a neoprene sealing strip and stainless steel toggle latches to keep the enclosure tightly sealed in all environment conditions. 316 stainless steel propstays hold the lid securely in place when open.

With a choice of specifications offered as standard, L type enclosure systems can be fitted with a variety of accessories and options in addition to the range of two, three and five-valve enclosure manifolds.

Enclosures are provided as standard in beige and black (anti-static option). Contact factory for any other color requirements.



Fire retardant

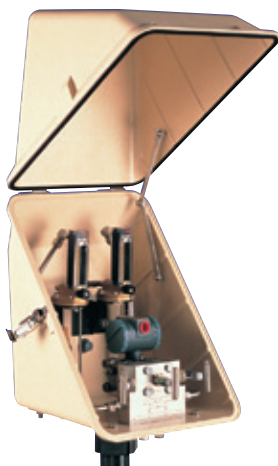
All enclosures are fire retardant to BS 5734 Part 1 Method 4 (for moulding compounds).

Brackets

Systems are supplied as standard with epoxy coated carbon steel base plates and brackets for mounting to 2" NB pipe stand. Stainless steel base plates and brackets are also available.

Anti-static

Enclosure systems are available in materials suitable for hazardous areas, to protect fully certified equipment from the risk of static build-up. These models comply with BS5501: Part 1 (section 11, paragraph 6) Ref: electrostatic charges and CENELEC EN 50014; available in black as standard.



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

L TYPE ENCLOSURES



5L

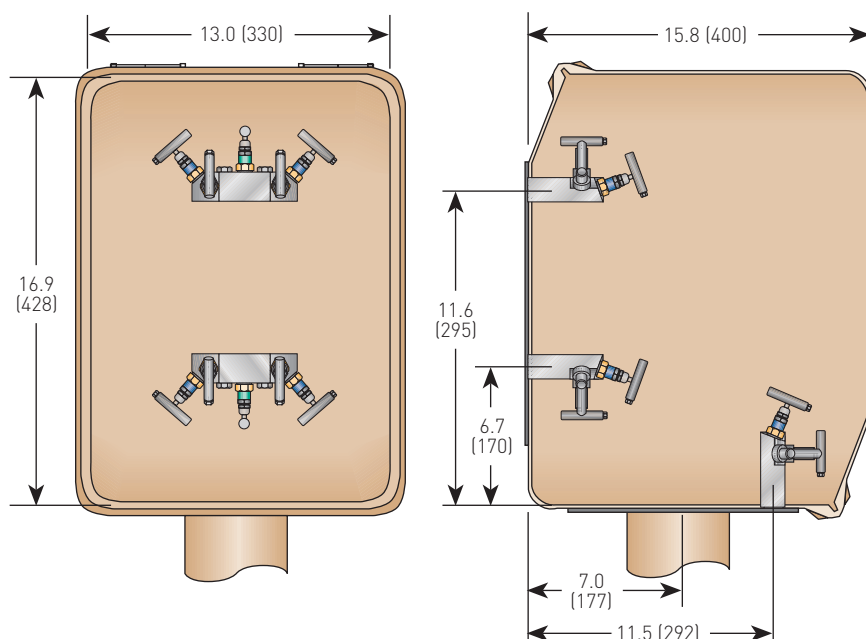
5L ENCLOSURE

The 5L enclosure is ideal for protecting single instrument installations, such as static pressure and differential pressure transmitters, pressure switches and indicators, indicating controllers and solenoid valves.

Approximate weight: 26.5 lb (12.0 kg).



DIMENSIONS, INCHES (mm)



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

L TYPE ENCLOSURES



15L

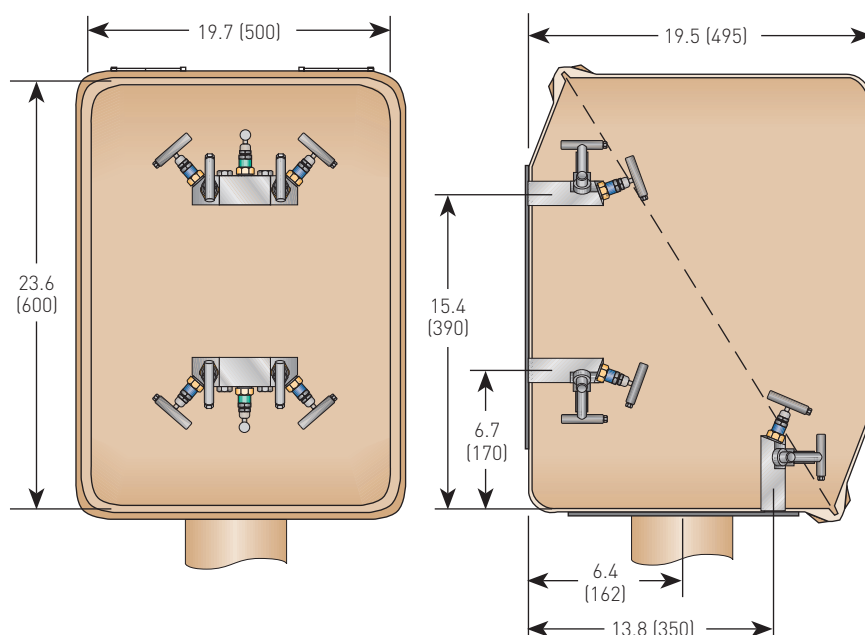
15L ENCLOSURE

The 15L enclosure is particularly suitable for large case transmitters, chart recorders and controllers or multiple instrument applications.

Approximate weight: 44.1 lb (20.0 kg).



DIMENSIONS, INCHES (mm)



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

L TYPE ENCLOSURES



24L

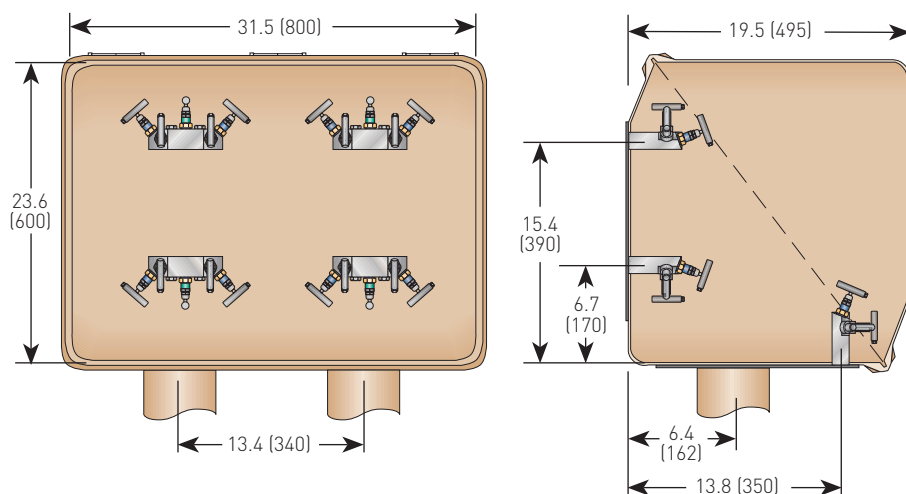
24L ENCLOSURE

Designed for multi-instrument assemblies the 24L is suitable for multiple transmitters, control systems, analyzers and large diaphragm type low pressure transmitters.

Approximate weight: 72.8 lb (33.0 kg).



DIMENSIONS, INCHES (mm)



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

TECHNICAL SPECIFICATIONS - EM MANIFOLD NEEDLE VALVE

A SERIES NEEDLE VALVE

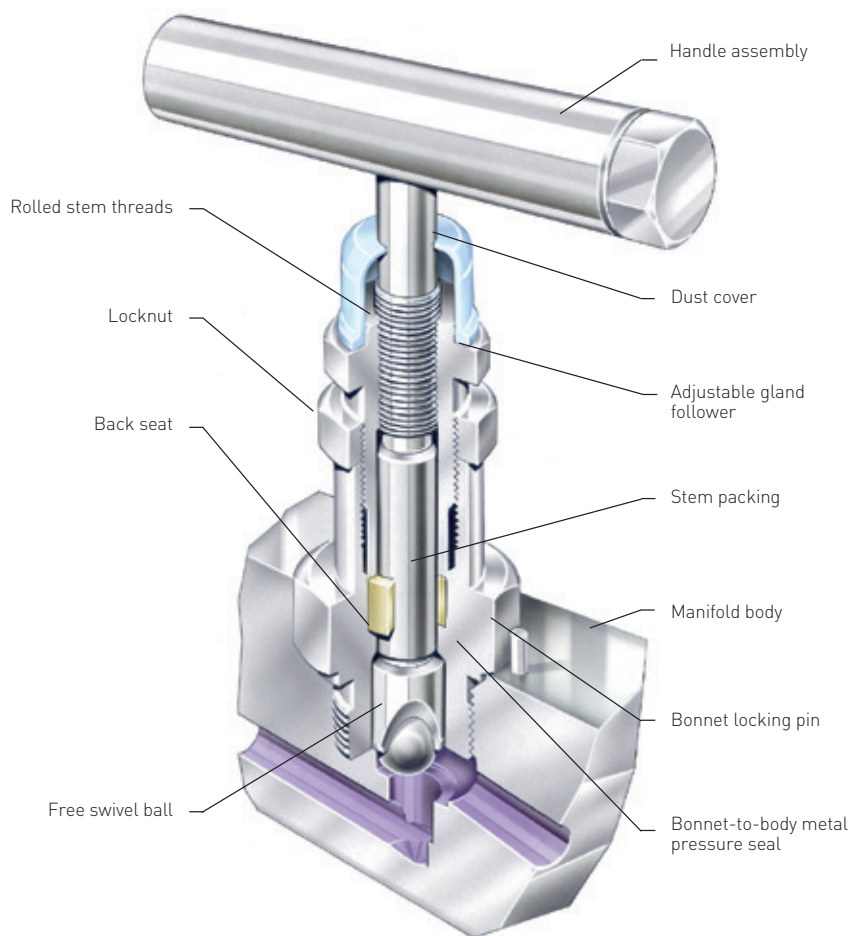
The A series needle valve is incorporated into enclosure manifolds for isolate, equalize and vent functions at pressures up to 10000 psig (690 barg).

Features

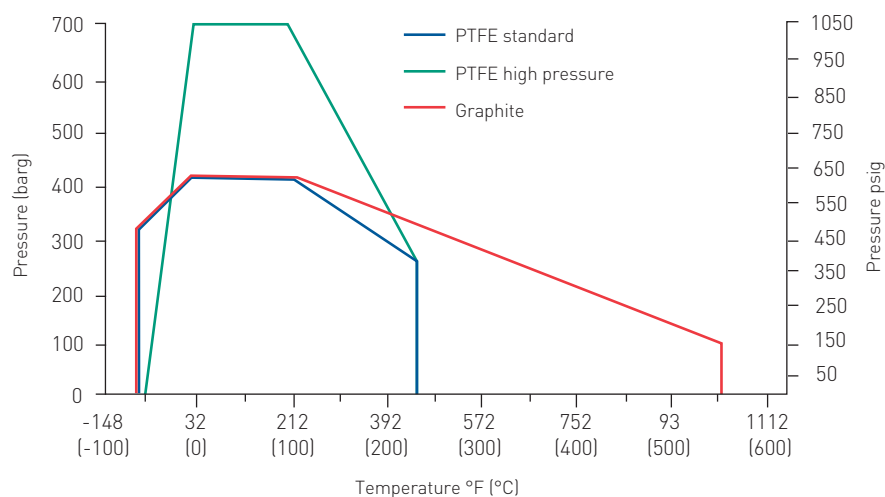
- Rolled stem threads for low operating torque and long cycle life, located above the spindle packing and completely isolated from the process.
- Graphite or PTFE stem packing for bubble tight sealing.
- Dust cap protects spindle threads from contamination and is color coded to identify packing material.
- Free swivel ball end stem for repetitive bubble-tight shut-off.
- Backseat design provides secondary stem sealing and prevents stem blowout.
- Adjustable gland follower and locknut allow easy access to adjust the packing gland.
- 0.2" (5 mm) bore.

Technical data

Materials:	SS
Seat:	Metal
Orifice size:	0.2" (5 mm)
Pressure (max):	6000 psig (414 barg) standard 10000 psig (690 barg) optional
Temperature range:	-71°F to 1000°F (-57°C to +537°C).



PRESSURE AND TEMPERATURE RATINGS



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

TECHNICAL SPECIFICATIONS - EM MANIFOLDS

STANDARD MATERIALS

Valve	Body	Bonnet	Stem	Ball seat	Non-wetted parts
SS	316 S11	316 SS	316 SS	316 SS	Austenitic SS
SG ¹	316 S11	316 SS	Alloy 400	Alloy K500	Austenitic SS

CONNECTIONS

Process

EM style manifolds are threaded 1/2" NPT female to ANSI/ASME B1.20.1.

EMF style manifolds are flanged and complete with 7/16" UNF tapped holes to accept a bolted kidney flange.

Instrument

Flanged for direct mounting to pressure and differential pressure transmitters.

VALVE BONNET IDENTIFICATION

Dust cap coding

The valve bonnet dust caps are color coded to identify the gland packing/stem:

White:	Standard bonnet assembly PTFE packing
Green:	Sour gas service PTFE packing
Blue:	High pressure service PTFE packing

Function ring label

Each valve bonnet is identified with a colored stainless steel ring label:

Blue:	Isolate
Green:	Equalize
Red:	Vent

MANIFOLD AND TRANSMITTER BOLTING^[3]

7/16" UNF high tensile steel mounting bolts are supplied as standard. Stainless steel bolts are available on request.

VALVE PACKINGS AND SEAL RINGS

The instrument connection is flanged for direct mounted instruments. PTFE seal rings are supplied with the standard PTFE packed bonnet.

Maximum pressure - 6000 psig (413 barg)
Maximum temperature - 500°F (260 °C)

Graphite seal rings are supplied with graphite gland packings for high temperature service.
Maximum pressure - 6000 psig (413 barg)
Maximum temperature - 1000°F (537°C)

SPECIAL MATERIALS

For severe service, manifolds are available in the following materials:

Duplex UNS S31803

Hastelloy® C276

Incoloy® 625

6MO UNS S31254

Please consult factory for availability.

Material traceability

Standard material traceability to EN10204- 3.1 manifold body only.



All EM manifold bonnets are identified with colored dust caps and ring labels

NOTES

1. SG (sour gas) meets the requirements of NACE MR0175/ISO 15156-3 Corrigendum 2 (for chloride conditions ≤ 50 mg/l (ppm)) and NACE MR0103-2009.
2. When mounting Rosemount 3051/3095 transmitters with Coplanar flange, longer bolts are required. Please see ordering code for details.
3. Incoloy® and Monel® are registered trademarks of Special Metals Corporation.
4. Hastelloy® is a registered trademark of Haynes International.

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

EM MANIFOLDS

EM2 / EM2T MANIFOLD

EM2 is a direct instrument mounting two-valve block and bleed manifold with 1/2" NPT female process connections to ANSI/ASME B1.20.1 and flanged instrument connection for direct mounting. The EM2T also has 1/2" NPT female process connections to ANSI/ASME B1.20.1 with 1/2" NPT female instrument connection for threaded pressure / gauge devices. The manifold allows for isolating, calibrating and venting functions in a single compact unit and is suitable for static and gauge pressure applications.

- Threaded 1/4" NPT female vent port, plugged as standard.
- Process and vent connections located in manifold base for easy installation.
- Liquid and vapor service.
- Optional integral steam heating ports.
- ATEX Certification - product certified to Ex II 1G g/c T1-T6 according to ATEX directive 94/9/EC for equipment intended for use in potentially explosive atmospheres (explosion groups II) as detailed in EN 13463-1:2001.

NOTE

Approximate weight: 5.5 lb (2.5 kg).

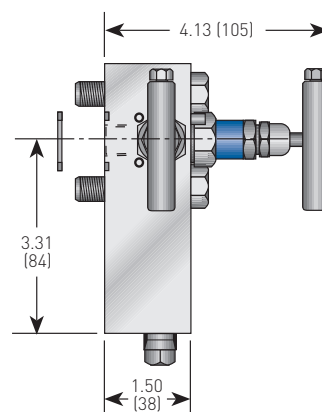
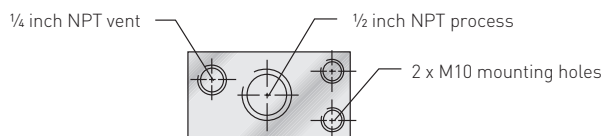
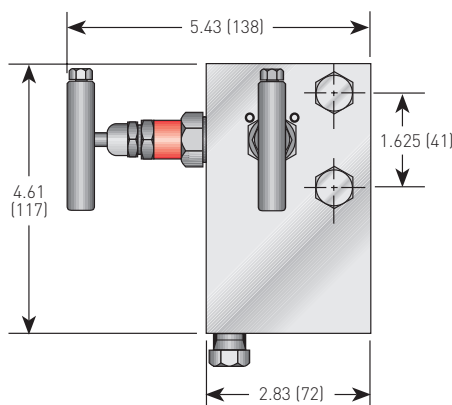


EM2 MANIFOLD

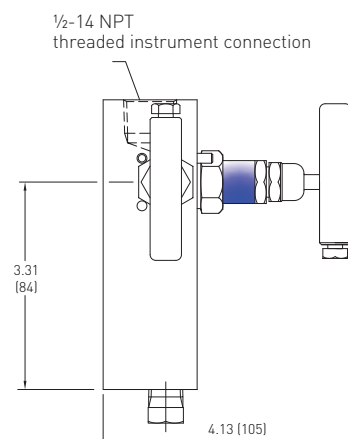
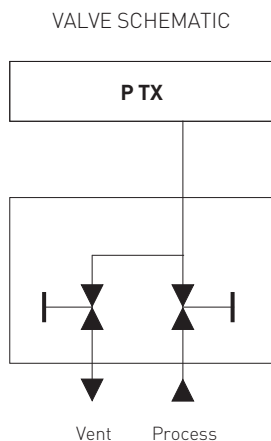
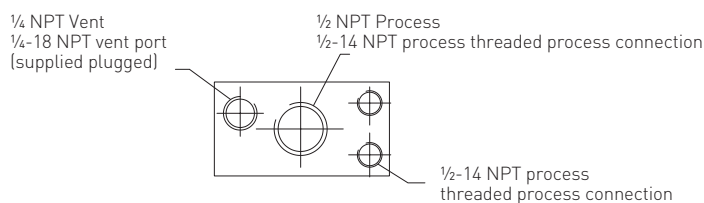
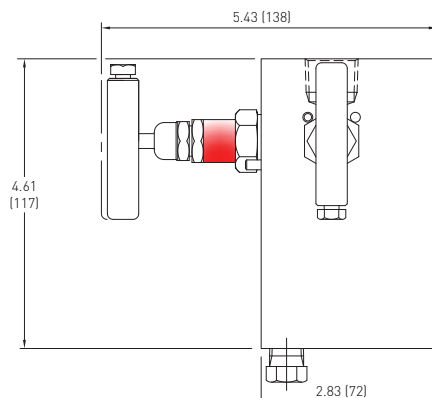


EM2T MANIFOLD

EM2 MANIFOLD - DIMENSIONS, INCHES (mm)



EM2T MANIFOLD - DIMENSIONS, INCHES (mm)



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

EM MANIFOLDS

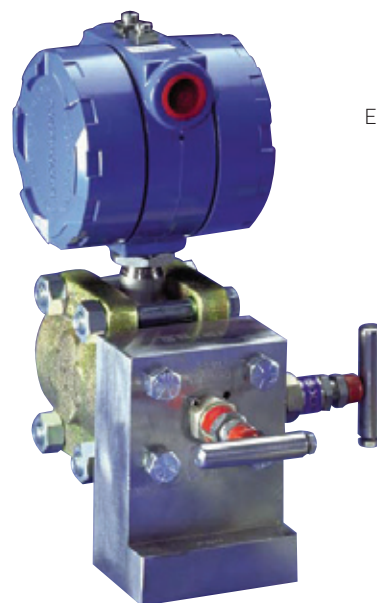
EM2F MANIFOLD

A direct mounting two-valve block and bleed manifold with flanged process and instrument connections. The EM2F allows process connections to be made with a process/kidney flange which is bolted onto the manifold and is suitable for static and gauge pressure applications which allow isolating, calibrating and venting functions in a single compact unit. The unit is also supplied as standard with 1/4" NPT female process tapplings allowing the additional use of tube fittings for remote mounted process lines and instruments.

- Threaded 1/4" NPT female vent port, plugged as standard.
- Process and vent connections located in manifold base for easy installation.
- Liquid and vapor service.
- Optional integral steam heating ports.
- Integral process/kidney flange breakaway joint for easy maintenance.
- Reduced leak paths.
- Process/kidney flange connection options include:
 - Female threaded connections.
 - Socket weld connections.
 - Butt weld connections.
- ATEX Certification - product certified to Ex II 1G g/c T1-T6 according to ATEX directive 94/9/EC for equipment intended for use in potentially explosive atmospheres (explosion groups II) as detailed in EN 13463-1:2001.

NOTE

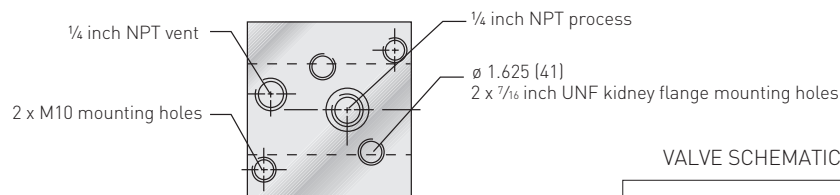
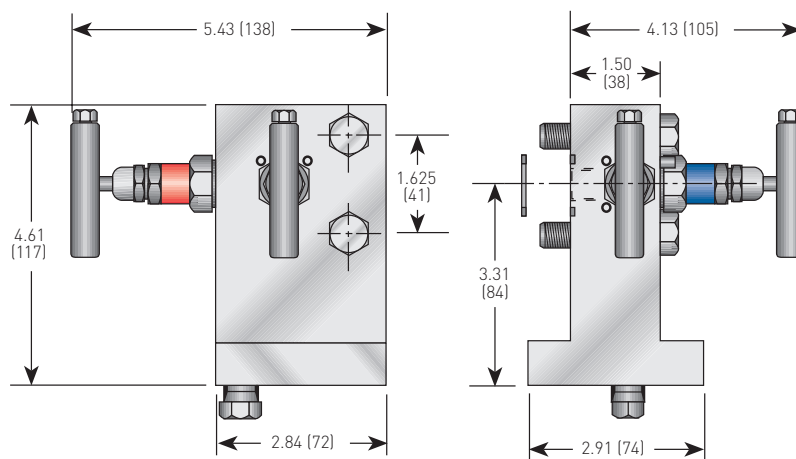
Approximate weight: 6.6 lb (3.0 kg).



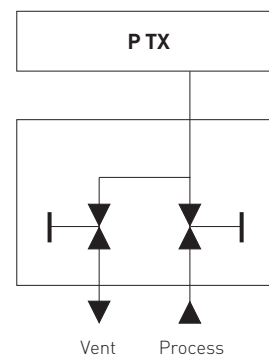
EM2F Manifold



DIMENSIONS, INCHES (mm)



VALVE SCHEMATIC



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

EM MANIFOLDS

EM3 MANIFOLD

A direct mounting double isolate and equalize three-valve manifold with 1/2" NPT female process connections to ANSI/ASME B1.20.1 and flanged instrument connections suitable for direct mounting to a differential pressure transmitter with standard 2 1/8" (54 mm) centers. The manifold is suitable for differential pressure applications which allow isolating and equalizing functions in a single compact unit.

- Process connections located in manifold base for easy installation.
- Liquid and vapor service.
- Optional integral steam heating ports.
- ATEX Certification - product certified to Ex II 1G g/c T1-T6 according to ATEX directive 94/9/EC for equipment intended for use in potentially explosive atmospheres (explosion groups II) as detailed in EN 13463-1:2001.

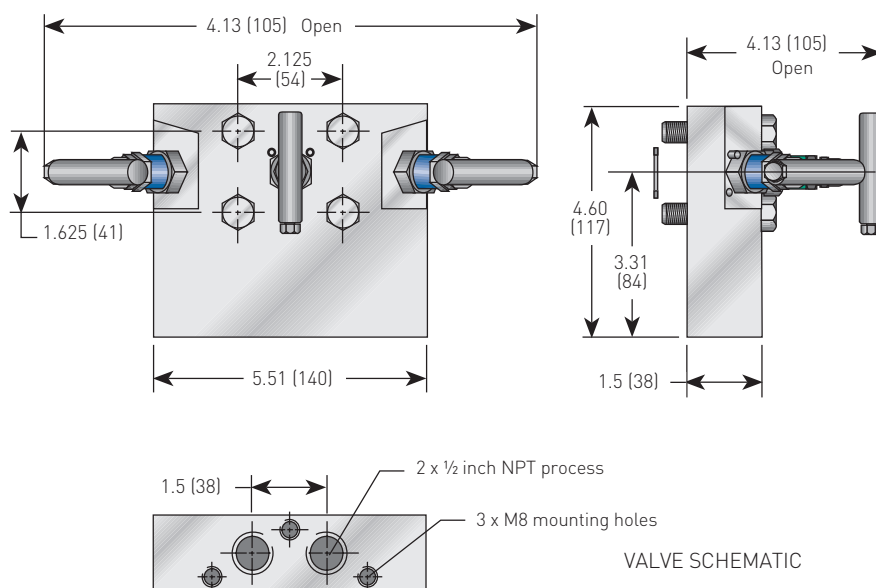
NOTE

Approximate weight: 9.9 lb (4.5 kg).



EM3 Manifold

DIMENSIONS, INCHES (mm)



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

EM MANIFOLDS

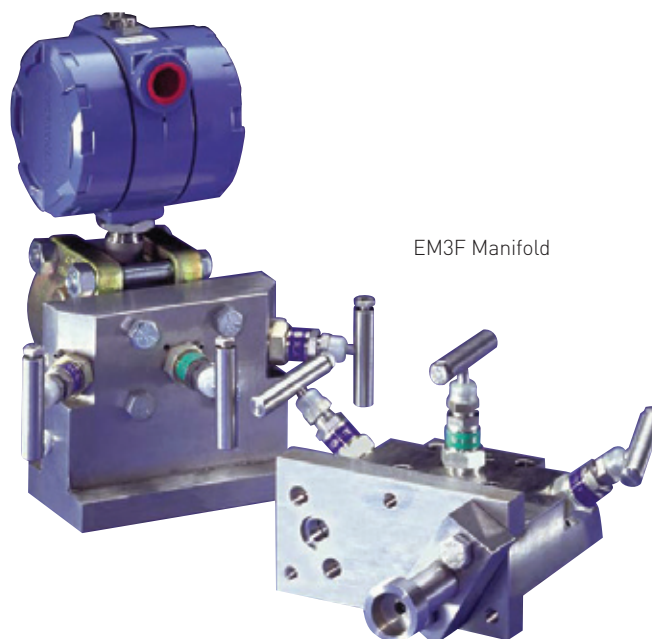
EM3F MANIFOLD

A direct mounting three-valve double isolate and equalize manifold with flanged process and instrument connections to suit standard 2½" (54 mm) centers. The EM3F allows process connections to be made with process/kidney flanges which are bolted on to the manifold and is suitable for differential pressure applications which allow isolating and equalizing functions in a single compact unit. The unit is also supplied as standard with ¼" NPT female process tapings, allowing the additional use of tube fittings for remote mounted process lines and instruments.

- Process connections located in manifold base for easy installation.
- Liquid and vapor service.
- Optional integral steam heating port.
- Integral process/kidney flange breakaway joint for easy maintenance.
- Reduced leak paths.
- Process/kidney flange connection options include:
 - Female threaded connections.
 - Socket weld connections.
 - Butt weld connections.
- ATEX Certification - product certified to Ex II 1G g/c T1-T6 according to ATEX directive 94/9/EC for equipment intended for use in potentially explosive atmospheres (explosion groups II) as detailed in EN 13463-1:2001.

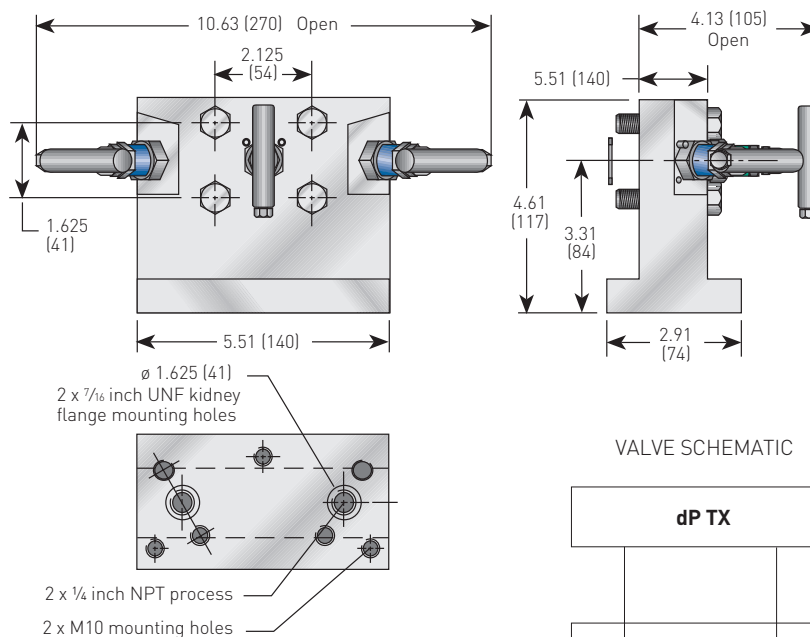
NOTE

Approximate weight: 11.0 lb (5.0 kg).

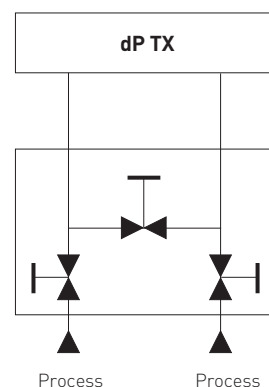


EM3F Manifold

DIMENSIONS, INCHES (mm)



VALVE SCHEMATIC



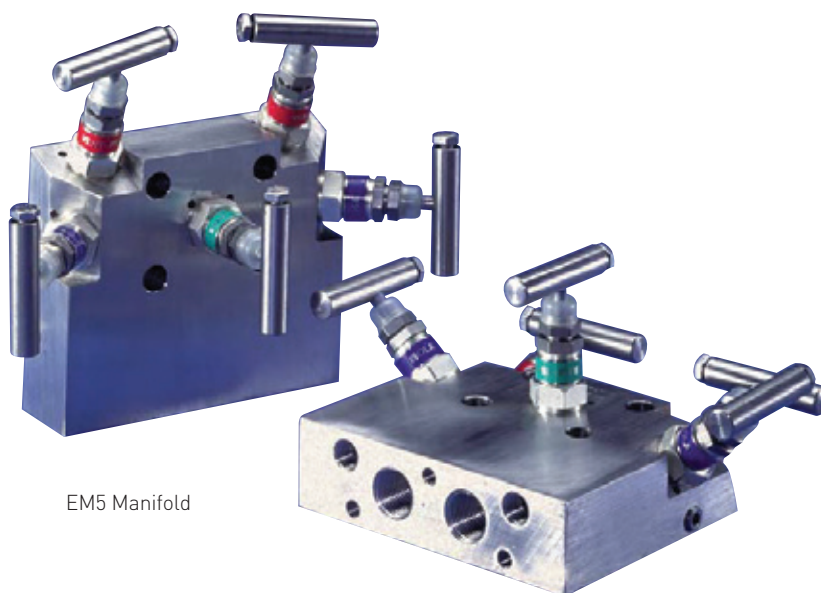
ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

EM MANIFOLDS

EM5 MANIFOLD

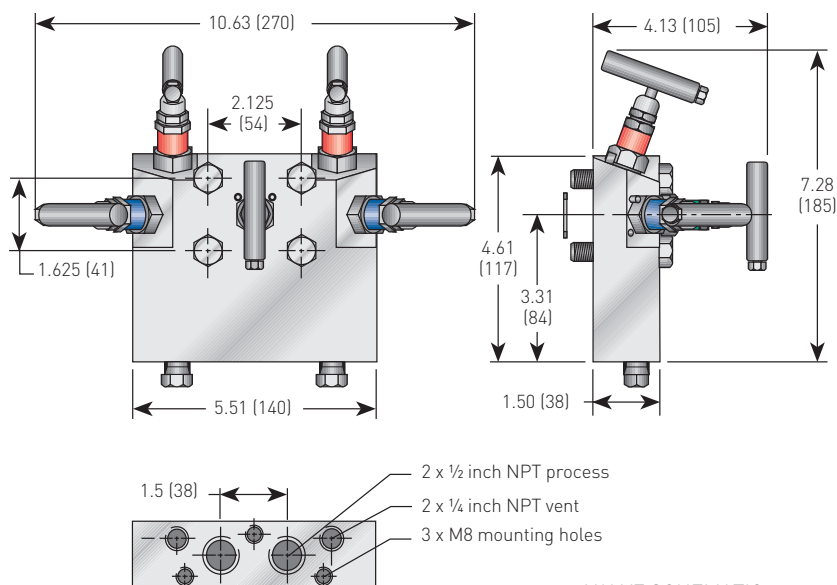
A direct mounting five-valve double isolate, equalize and double vent manifold with 1/2" NPT female process connections to ANSI/ASME B1.20.1 and flanged instrument connections suitable for direct mounting to a differential pressure transmitter with standard 2 1/8" (54 mm) centers. The manifold is suitable for differential pressure applications which allow isolating, equalizing and venting functions in a single compact unit.

- Threaded 1/4" NPT female vent ports, plugged as standard.
- Process and vent connections located in manifold base for easy installation.
- Liquid and vapor service.
- Optional integral steam heating ports.
- ATEX Certification - product certified to Ex II 1G g/c T1-T6 according to ATEX directive 94/9/EC for equipment intended for use in potentially explosive atmospheres (explosion groups II) as detailed in EN 13463-1:2001.



EM5 Manifold

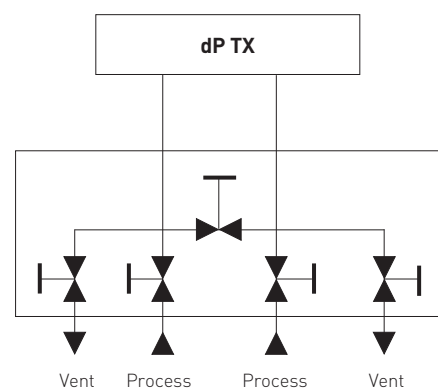
DIMENSIONS, INCHES (mm)



NOTE

Approximate weight: 11.0 lb (5.0 kg)

VALVE SCHEMATIC



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

EM MANIFOLDS

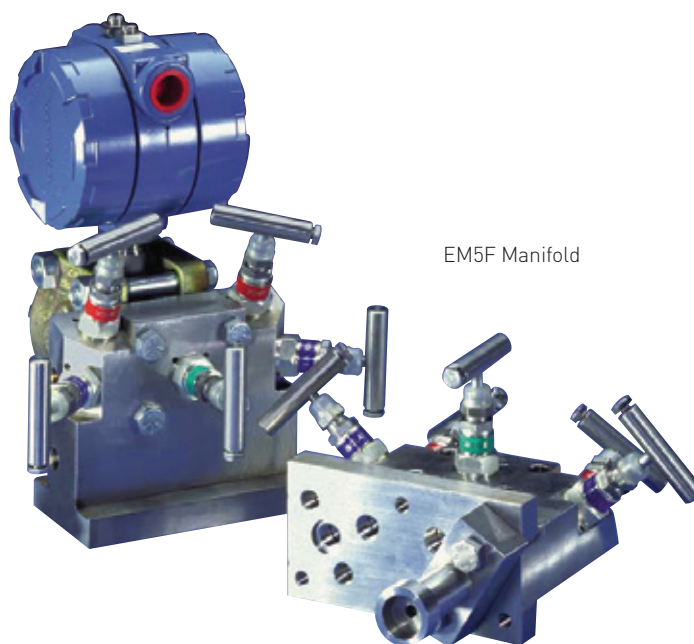
EM5F MANIFOLD

A direct mounting five-valve double isolate, equalize and double vent manifold with flanged process and instrumentation connections to suit standard 2½" (54 mm) centers. The EM5F allows process connections to be made with process/kidney flanges which are bolted onto the manifold and is suitable for differential pressure applications which allow isolating, equalizing and venting facilities in a single compact unit. The unit is also supplied as standard with ¼" NPT female process tapings, allowing the additional use of tube fittings for remote mounted process lines and instruments.

- Threaded ¼" NPT female vent ports, plugged as standard.
- Process and vent connections located in manifold base for easy installation.
- Liquid and vapor service.
- Optional integral steam heating ports.
- Integral process/kidney flange breakaway joint for easy maintenance.
- Reduced leak paths.
- Process kidney flange connection options include:
 - Female threaded connections.
 - Socket weld connections.
 - Butt weld connections.
- ATEX Certification - product certified to Ex II 1G g/c T1-T6 according to ATEX directive 94/9/EC for equipment intended for use in potentially explosive atmospheres (explosion groups II) as detailed in EN 13463-1:2001.

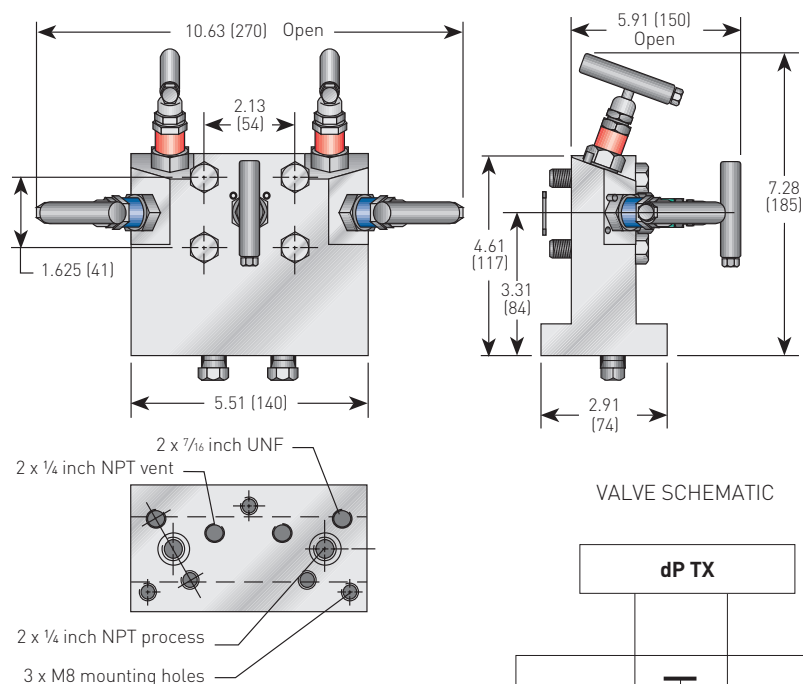
NOTE

Approximate weight: 12.1 lb (5.5 kg).

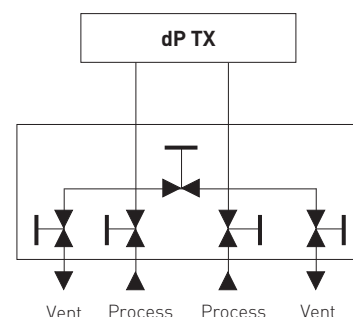


EM5F Manifold

DIMENSIONS, INCHES (mm)



VALVE SCHEMATIC



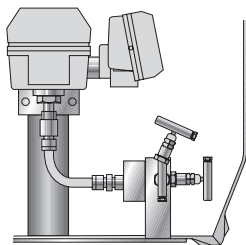
ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

EM MANIFOLD ACCESSORIES AND OPTIONS

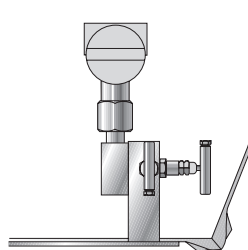
ENCLOSURE MANIFOLD ACCESSORIES

Manifold adaptors

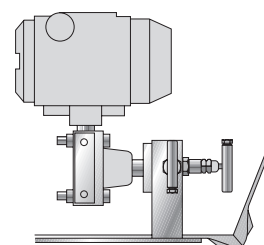
There are three adaptors available to enable instruments with screwed process ports to be connected to EM manifolds:



-MA - Horizontal adaptor - 1/2" connection.



-VMA - Vertical adaptor - 1/2" NPT female connection (EM2 only).



-MMA - Horizontal adaptor - 1/2" NPT male connection.

Materials

Manifold accessories are available in stainless steel. For other materials please consult factory.

EM MANIFOLD OPTIONS

- AT - Anti-tamper bonnet
Valve bonnets are available with a removable T-bar key to prevent unauthorized operation.
- K - Key for anti-tamper bonnet
- LAT - Lockable anti-tamper bonnet
Valves with lockable anti-tamper bonnets can be supplied for padlocking, providing added security.
- PD - Padlock for LAT
- ISH - Integral steam heating ports (1/4" NPT female) - consult factory.
- Optional ball end stems
 - CB Ceramic ball
 - ST Stellite ballSpecially hardened materials suitable for particularly corrosive or erosive duties.
- R3V - Bolt installation kit for Rosemount 3051/3095 (with Coplanar® flange)
- HB - High back mounted manifold in enclosure
- LB - Low back mounted manifold in enclosure
- SG - Sour gas service^[1]
Valves are available in materials which comply with the NACE MR0175 standard.
- SSB - ASTM A192 B8M CL2
Stainless steel bolts (316)
- SSC - ASTM A193 B8M
Stainless steel bolts (316)
Maximum pressure 4500 psig (306 barg)

NOTES

1. SG (sour gas) meets the requirements of NACE MR0175/ISO 15156-3 Corrigendum 2 (for chloride conditions ≤ 50 mg/l [ppm]) and NACE MR0103-2009.
2. Coplanar® is a registered trademark of Rosemount, Inc.



Valve bonnet anti-tamper facility

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

EM MANIFOLD ACCESSORIES AND OPTIONS

MANIFOLD ACCESSORIES

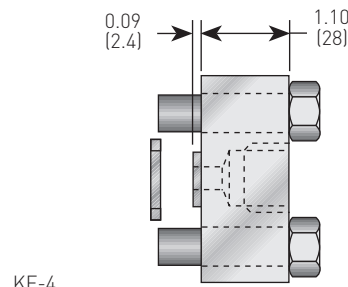
Process/kidney flanges

Concentric kidney flanges are available for bolting to the process side of EMF flanged manifolds. Suitable for use in a close couple instrument loop, kidney flanges also provide the ideal solution to welded connection requirements, allowing the process/kidney flange to be welded to the process piping whilst keeping the flexibility to remove the manifold by releasing the bolts. Each kidney flange is supplied with two $\frac{7}{16}$ " UNF HT steel mounting bolts, washers and a PTFE gasket. Graphite gaskets are available for applications over 500°F (260°C).

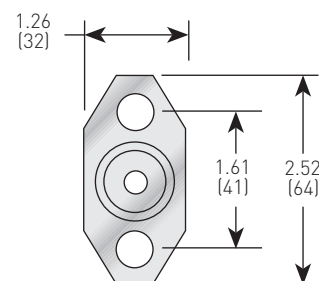
Maximum pressure rating: 6000 psig (413 barg)

PROCESS/KIDNEY FLANGE DIMENSIONS, INCHES (mm)

$\frac{1}{2}$ inch NPT female



KF-4



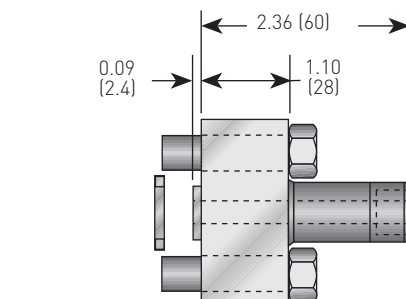
ORDERING INFORMATION

Connection	CS	SS
$\frac{1}{2}$ " NPT F	KFC-4	KFS-4
$\frac{1}{2}$ " NPT M	KFC-44	KFS-44
$\frac{1}{2}$ " Butt weld	KFC-4BW	KFS-4BW
$\frac{1}{2}$ " Socket weld	KFC-4B	KFS-4B

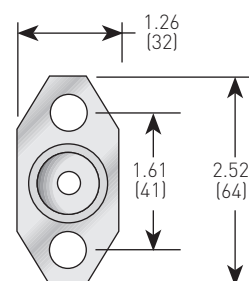
NOTES

- For stainless steel bolts, please suffix part number:
 - SSB (ASTM A193 B8M CL2) maximum pressure 6000 psig (413 barg);
 - SSC (ASTM A193 B8M) maximum pressure 4500 psig (306 barg), e.g. KFS-4-SSB.
- For butt weld end, please specify pipe schedule, e.g. KFS-4BW080.

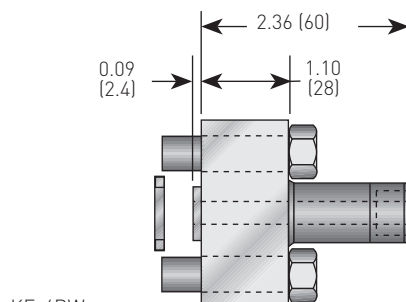
$\frac{1}{2}$ inch NPT male



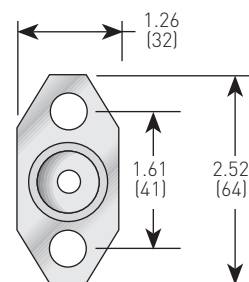
KF-44



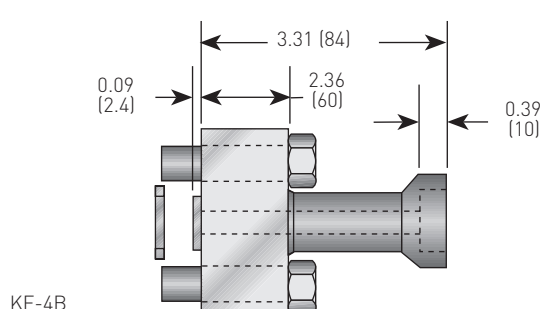
$\frac{1}{2}$ inch NB but weld



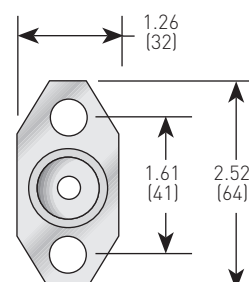
KF-4BW



$\frac{1}{2}$ inch NB socket weld



KF-4B



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

ACCESSORIES - ELECTRICAL HEATING

COMPLETE HEATING SYSTEMS

A complete range of electrical heaters is available, suitable for a variety of plant conditions. Five main types offer a variety of configurations with a choice of thermostats, hazardous or non-hazardous area heaters and plastic junction boxes. All heating circuits are pre-assembled to the required power rating.

Product features

- Heating systems purpose-designed to plant and environmental conditions.
- Choice of hazardous or non-hazardous area heaters.
- Hazardous area heaters with ATEX specification approval.
- Heater outputs from 100W to 500W.
- Choice of self limiting or fixed output heaters.
- Choice of junction boxes.
- Choice of fixed or adjustable thermostats.
- Heaters are installed to take up the minimum space inside the enclosure.
- Insulated enclosures available to reduce system heat loss and heater wattage.

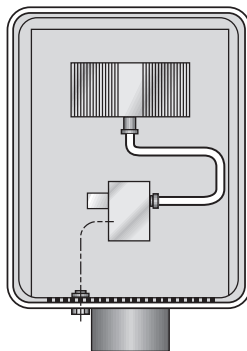
Site installation assessments

The enclosure assembly offered incorporates a 'space' heater arrangement, which is designed to provide temperature support of the internal air environment.

Ambient and/or reduced temperature environmental conditions acting on impulse line connections may have a significant effect on the temperature of components within the enclosure (i.e. manifold(s), transmitter(s)). Therefore, it is recommended that insulation/heat trace of impulse lines (and connections) up to the enclosure assembly is part of the site installation assessment.

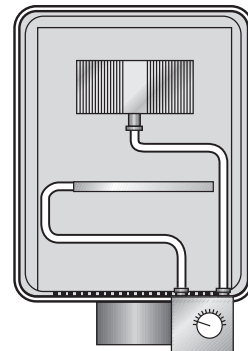
Please advise if there are any specific considerations that need to be taken into account relating to the site installation/application conditions, to enable further review and confirmation on the suitability of temperature protection offered for equipment contained within the enclosure.

HEATING SYSTEM CONFIGURATIONS



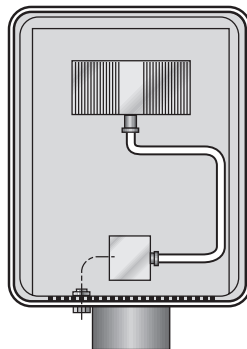
Type 'A'

Type A: finned panel heater with plastic junction box and pre-set thermostat. Suitable for hazardous areas.



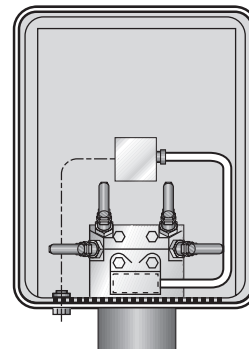
Type 'E'

Type E: finned panel heater with plastic junction box and fitted adjustable thermostat, with liquid filled capillary sensor. Suitable for hazardous areas where precise control is required. Consult factory.



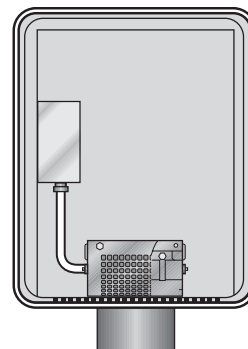
Type 'D'

Type D: finned panel heater with plastic junction box. Suitable for hazardous areas.



Type 'F'

Type F: direct mounting manifold heater with plastic junction box. Suitable for hazardous areas.



Type 'G'

Type G: adjustable heater with adjustable thermostat. Suitable for non-hazardous areas.

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

ACCESSORIES - ELECTRICAL HEATING

HAZARDOUS AREAS

FHA - Self limiting finned panel heater - EExd rated

The FHA heater is produced from a self limiting semi-conductor heater element, so the heater can be used without a thermostat. It is provided with a finned aluminum body to ensure maximum thermal efficiency and also varies its output as ambient temperature rises, making it more efficient than conventional heaters. The FHA heater is available in 100, 200 and 500 Watt units and features a 3-core wire cable.



MH - Direct mounting manifold heater

The MH heater is designed to mount directly onto the enclosure manifold, which becomes the heat sink. It ensures constant manifold temperatures with power consumption of 100 Watts. Self-limiting heating element to prevent over-heating and providing power consumption savings.

The MH heater is fitted to the EM manifolds with bolts and features a 3-core silicon cable.



NON-HAZARDOUS AREAS

EH - Industrial heater¹

A compact air heater which can be used for frost protection and is suitable for use on all non-hazardous areas. The self limiting semi-conductor heating element is suitable for use with 240V AC or 110V AC.

The 100 Watt heater can be supplied for site fitting or factory fitted and wired to an adjustable +50°F to +86°F (+10°C to +30°C) air sensing thermostat.



NOTES

1. 500W non-hazardous area heater is also available: Type EH-500.
2. All heaters are supplied as standard with 240 volt AC power supply. 110 volt AC is also available, please specify where required.

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

ACCESSORIES - THERMOSTATS AND JUNCTION BOXES

FFT thermostat - EExd rated

The FFT is a fixed flameproof thermal switch suitable for hazardous areas. It is explosion protected and suitable for use inside enclosures to control temperatures or as an alarm monitor. Standard units are supplied set at 68°F (20°C).

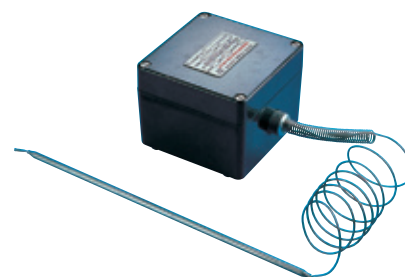
The thermostat can be supplied either on its own or fitted to a PJB1 junction box and can be supplied with an ATEX certificate of conformity.



BST thermostat/junction box - EExde rated

The BST is an adjustable surface temperature thermostat /junction box suitable for use in hazardous areas. Consult factory for this option.

Standard units are supplied with the setting range: +32°F to +122°F (0°C to +50°C) and can be supplied with an ATEX EExd certificate.



PJB plastic junction box - EExe rated

The PJB is a flame-retardant plastic junction box suitable for hazardous area installations and uses Exe terminals. It is available in two sizes, either as a mini terminal box (PJB2) with two entries, or as a larger three port box (PJB1), which is available fitted with an FFT thermostat and heater connections. The boxes are explosion protected to EExe and ATEX certified. They have a removable lid and include a terminal rail and earthing studs.



IT - thermostat - non-hazardous

The IT is an adjustable air sensing surface mounted thermostat in a plastic junction box suitable for non-hazardous areas. Setting range: +32°F to +86°F (+10°C to +30°C).



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

ACCESSORIES - TECHNICAL SPECIFICATIONS

HEATERS

Model no.	Power output (watts)	Power supply (volts AC)	Heater type	Electrical approval	Dimensions, inches (mm)					
					Width		Height		Depth	
MH-B3	100	240	EM manifold	Non hazardous	3.07	(78)	1.18	(30)	1.34	(34)
FHA-100	100	240	Finned	ATEX II 2G Exd IIc T3	3.94	(100)	2.13	(54)	2.13	(54)
FHA-200	200	240	Finned	ATEX II 2G Exd IIc T3	3.94	(100)	2.13	(54)	2.13	(54)
FHA-500	500	240	Finned	ATEX II 2G Exd IIc T3	6.46	(164)	2.13	(54)	2.13	(54)
EH-500	500	240	Finned	None approved (none certified)	6.46	(164)	2.13	(54)	2.13	(54)
EH5	100	240	Finned	None approved (none certified)	3.94	(100)	2.13	(54)	2.13	(54)

THERMOSTATS

Model no.	Range	Switching tolerance on set temperature	Electrical approval	Dimensions, inches (mm)				
				Box			Probe	
				Width	Height	Depth	Width	Height/length
FFT	Fixed + 68°F (20°C)	23°F to 41°F (-5° to 5°C)	ATEX EExd IIc T6	-	-	-	1.18 (30)	1.77 (45)
BST	Adjustable surface thermostat Consult factory							
IT	+50°F to +86°F (+10°C to +30°C)		None approved (none certified)	3.31 (84)	3.31 (84)	1.46 (37)	-	-

JUNCTION BOXES

Model no.	Electrical approval	Dimensions, inches (mm)		
		Width	Height	Depth
PJB1	ATEX EExe II T6	4.33 (110)	2.80 (71)	5.39 (137)
PJB2	ATEX EExe II T6	3.15 (80)	2.95 (75)	2.16 (55)

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

ACCESSORIES - ORDERING INFORMATION

To order individual components please use the model numbers on page 20.

To order combinations please use the coding below.

SELECTION GUIDE

Example:	FS	A	5
Heater type			
FS	Finned heater		
MH	Manifold heater		
E5	Industrial heaters 100 Watt		
E500	Industrial heaters 500 Watt		
TS	Tape heater (Consult factory)		
Configuration			
A	PJB1 Junction box fitted with FFT Thermostat		
D	PJB2 Junction box (panel heater)		
F	PJB2 Junction box (manifold heater)		
G	IT Thermostat (non-hazardous)		
E	BST Thermostat/junction box (consult factory)		
Heater size			
0	FHA - 500, EH - 500		
5	FHA - 100, EH5 - 100		
7	FHA - 200		
9	MH - B3 (100W)		
Note: for any of the following selection codes please consult factory			
4	TS - 50W		
5	TS - 100W		
6	TS - 200W		
8	MH - 50W		

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

ACCESSORIES - STEAM HEATING

Where steam is available on site, enclosure systems can be heated directly through the EM manifold block or, if necessary, via a separate copper or stainless steel steam coil.

Steam heating integral with manifolds

EM manifolds can be manufactured with an optional integral steam channel which allows efficient heating of the process through the manifold. This type of heating is ideal for maintaining high process temperatures as it provides heat in the manifold and transmitter body where it is most effective.

The EM3 and EM5 can have optional steam entry and exit connections located in the base of the manifold adjacent to the process connections. The EM2 has optional steam entry and exit connections located in the sides of the manifold and requires a standard copper or stainless steel steam coil, which terminates in bulkhead fittings.

Connections

All steam connections are threaded 1/4" NPT as standard.

Performance

Typical performance of an integral steam heated manifold in an insulated and uninsulated enclosure for a number of steam pressures is shown in the graph, based on independent laboratory tests in simulated outdoor conditions.

Please consult the factory for specific details.

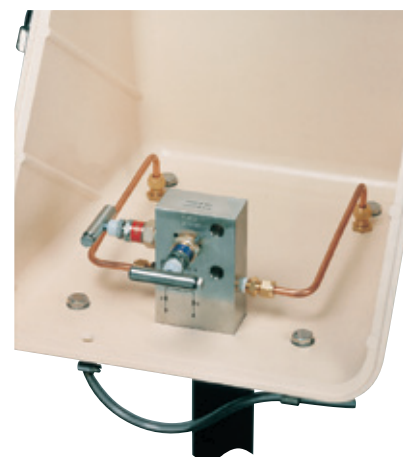
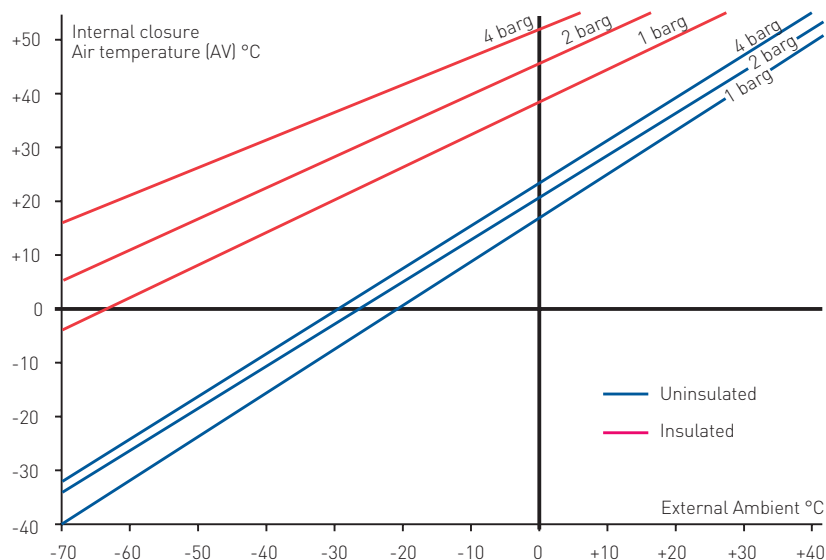
Ordering information

ISH must be added to the model number of the relevant EM manifold i.e. EM3VIS-4-ISH.

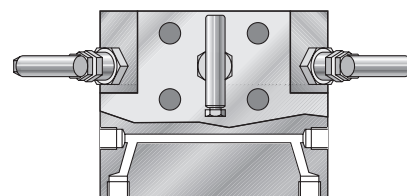
Steam coils

Coils are standard in stainless steel or copper and terminate in a bulkhead fitting. Heat output can be boosted by passing the steam coil through a heat exchanger block.

5L ENCLOSURE-STEAM HEATED MANIFOLD ASSEMBLY



EM2
Steam heating



EM3/5
Steam heating



Steam coil

ORDERING INFORMATION

Coil size	Copper	Stainless steel
1/4"	XS.Cu.25	XS.S.25
3/8"	XS.Cu.38	XS.S.38

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

ACCESSORIES - ENCLOSURE OPTIONS

INSTRUMENT SERVICES



W - Windows

Windows for all enclosures are circular and made from toughened low-heat-loss glass with a windscreen type rubber seal.

BS - 316 Stainless steel baseplate.



L-Locks

To prevent unauthorized access, stainless steel padlock brackets and brass padlocks can be fitted to the enclosure on request.

UD - 'U' drain in base of enclosure

LH - 316 Stainless steel lifting handle on enclosure lid (two on 24L)



-GP with CG

GPB - Gland plate 7.9" x 3.0" (200 x 77 mm)

GRP gland plate is available either factory fitted or with a drilling template for site fitting. Supplied either blank, pre-drilled or fitted with grommets, electrical glands or bulkhead fittings to customers' requirements. Available on the full range of enclosures.



SGP - Split gland plates

Made from austenitic stainless steel, the split gland plate allows exit of a sealed capillary on instruments having remote sensing devices. Made to individual specification and available on the full range of enclosures.

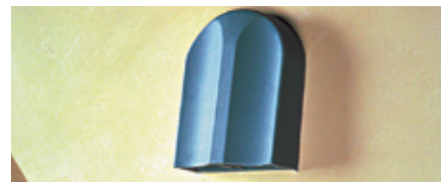


Ventilation

Enclosures can be supplied with louvers or ventilators to allow 'breathing' when the enclosures are closed. A single unit will prevent the build-up of air pressure or excessive heat. When fitted in pairs the vents give through ventilation to prevent condensation inside the enclosure or the build up of gases.

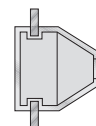
LR - Louvers

Made from austenitic stainless steel, the standard size is 5.9" x 3.9" (150 x 100 mm), available on the full range of enclosures.



VR - Ventilators

GRP weir type ventilator measures 2.75" x 3.15" (70 mm high x 80 mm wide) and is fitted in a round hole measuring 1.10" (28 mm) diameter. Available on the full range of enclosures.



CG - Cable glands

Cable Glands are available in nylon (plastic), brass or 316 SS as required. Glands for use in hazardous areas are also available.

G - Grommets

Grommets made from ethylene propylene are available for all enclosures. Please consult the factory for other sizes.

GROMMETS

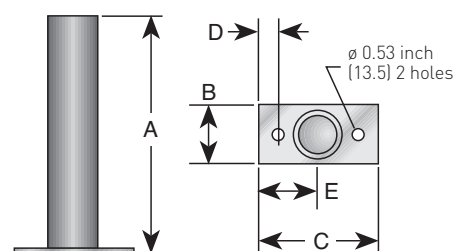
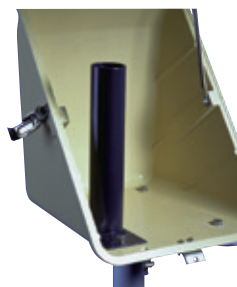
Part no.	Grommet size (mm)
G1	5 - 7
G2	7 - 10
G3	10 - 14
G4	14 - 20
G5	20 - 26
G6	26 - 35

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

ACCESSORIES - INTERNAL MOUNTING

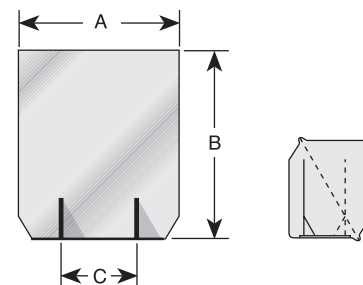
IPS - Internal pipestand

The standard internal 2" NB epoxy coated carbon steel pipestand is available for use in all enclosures. A 2" NB Sch 80 internal pipestand (full base) can also be supplied.



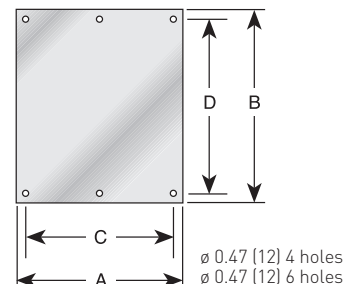
VMP - Vertical mounting plate

An 'L-shaped' vertical mounting plate can be fitted to the rear or front of an enclosure. Cut outs and holes are drilled to individual specification. The VMP is 0.12" (3 mm) thick and made from epoxy coated carbon steel plate.



BMP - Back mounting plate

The back wall of an enclosure can be fitted with a 0.12" (3 mm) thick epoxy coated carbon steel plate for instrument mounting if required.



Special bracketing

Specially designed and fabricated bracketing is available to allow non-standard instruments or other equipment to be mounted inside an enclosure.



NOTE

1. All brackets are also available in 316 stainless steel as an option. Add S to model no., e.g. VMPS.

DIMENSIONS, INCHES (mm)

Model no.	A	B	C	D	E	Wt. lb (kg)
IPS						
	11.80 (300)	2.95 (75)	5.90 (150)	1.0 (25)	2.95 (75)	4.4 (2)
VMP						
5L	10.82 (275)	14.20 (360)	9.65 (245)	-	-	8.8 (4)
15L	15.75 (400)	18.70 (475)	7.50 (190)	-	-	13.2 (6)
24L	27.15 (690)	18.70 (475)	19.30 (490)	-	-	22 (10)
BMP						
5L	9.65 (245)	11.22 (285)	8.07 (205)	9.85 (250)	-	6.6 (3)
15L	13.40 (340)	15.75 (400)	11.80 (300)	14.17 (360)	-	4.4 (4)
24L	25.20 (640)	15.75 (400)	19.70 (500)	14.17 (360)	-	13.2 (6)

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

ACCESSORIES - ENCLOSURE MOUNTING

PS - Pipestands

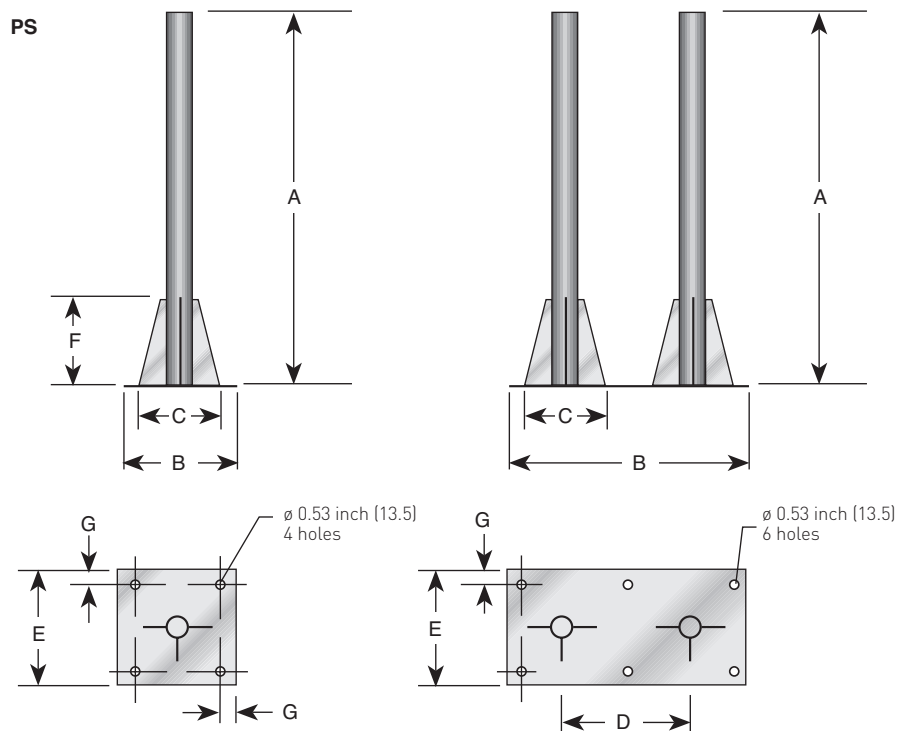
All enclosures are supplied as standard with baseplates and a collar with pinch bolt to suit 2" NB pipestands. The standard enclosure pipestand is 39.40" (1 m) high.

All instrument shades are supplied as standard with vertical mounting brackets to suit 2" NB pipestands. The standard shade pipestand is 59.0" (1.5 m).

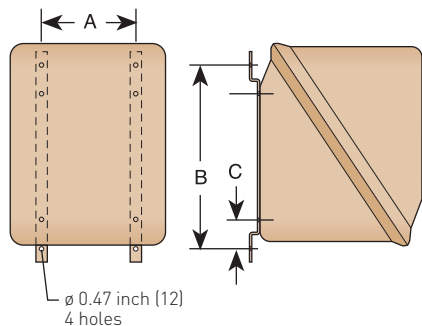
Models 5L/5S and 15L/15S require a single pipestand, 24L/24S require twin pipestands. The PS is made from 2" NB Sch 80 epoxy coated carbon steel.

WMS - Wall mounting straps

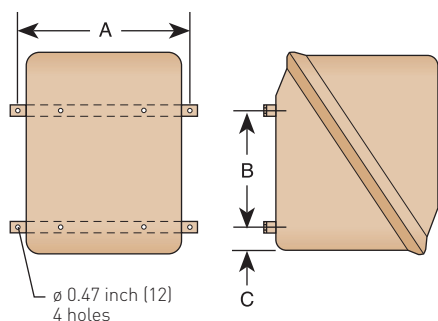
All enclosures and shades can be supplied with either vertical or horizontal wall mounting straps made from epoxy coated carbon steel.



WMSV



WMSH



DIMENSIONS, INCHES (mm)

Model no.	A	B	C	D	E	F	G	Weight	
								lb	(kg)
PS									
PS1M	39.37 (1000)	12.00 (305)	7.50 (190)	-	12.00 (305)	9.05 (230)	1.50 (38)	26.5	(12)
PS15M	59.00 (1500)	12.00 (305)	7.50 (190)	-	12.00 (305)	9.05 (230)	1.50 (38)	35.3	(16)
PS1MT	39.37 (1000)	25.00 (635)	7.50 (190)	13.40 (340)	12.00 (305)	9.05 (230)	1.50 (38)	57.3	(26)
PS15MT	59.00 (1500)	25.00 (635)	7.50 (190)	13.40 (340)	12.00 (305)	9.05 (230)	1.50 (38)	61.7	(28)
WMSV									
5L	8.07 (205)	15.35 (390)	0.70 (17)	-	-	-	-	4.4	(2)
15L	11.80 (300)	25.60 (650)	2.63 (67)	-	-	-	-	8.8	(4)
24L	23.62 (600)	25.60 (650)	2.63 (67)	-	-	-	-	8.8	(4)
WMSH									
5L	13.00 (330)	9.85 (250)	2.08 (53)	-	-	-	-	4.4	(2)
15L	23.62 (600)	14.17 (360)	3.07 (78)	-	-	-	-	8.8	(4)
24L	35.43 (900)	14.17 (360)	3.07 (78)	-	-	-	-	8.8	(4)

NOTE

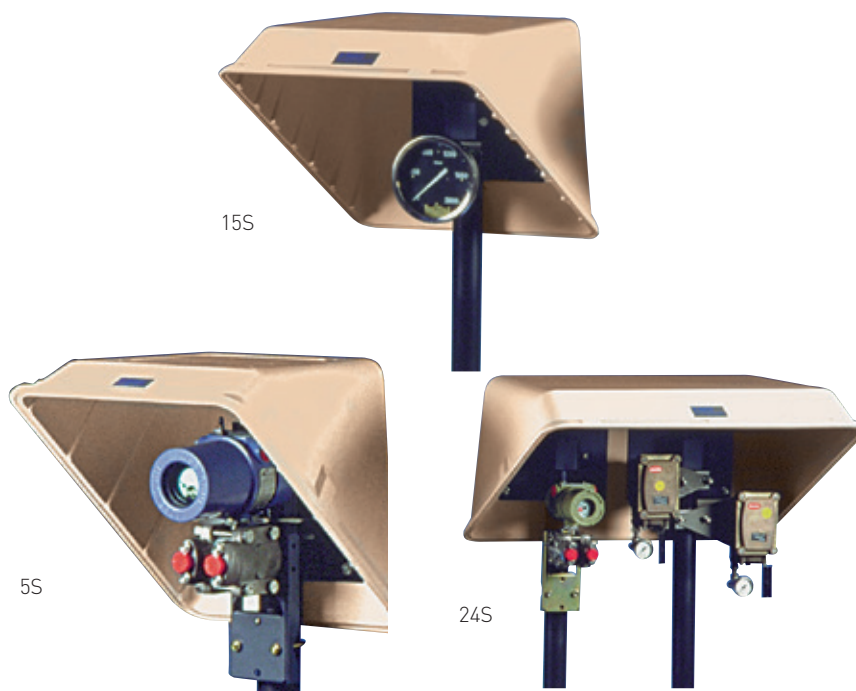
- All pipestands and wall straps are also available in 316 stainless steel as an option.
Add S to model no., e.g. WMSVS

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

INSTRUMENT SHADES

Instrument shades are available in three sizes to provide cover from industrial to desert conditions offering protection against rain, snow, direct sunlight and falling objects for most instrument installations. All shades can also help to minimize the effects of instrument drift by reducing instrument surface temperature in direct sunlight and offer:

- Glass reinforced polyester sheet moulded for rigid construction.
- Standard color: beige.
- Austenitic steel fastener and fittings.
- Suitable for environments from -94°F to +176°F (-70°C to +80°C).
- Epoxy coated carbon steel back plate and collar as standard.
- Fire retardant.
- Anti-static option.

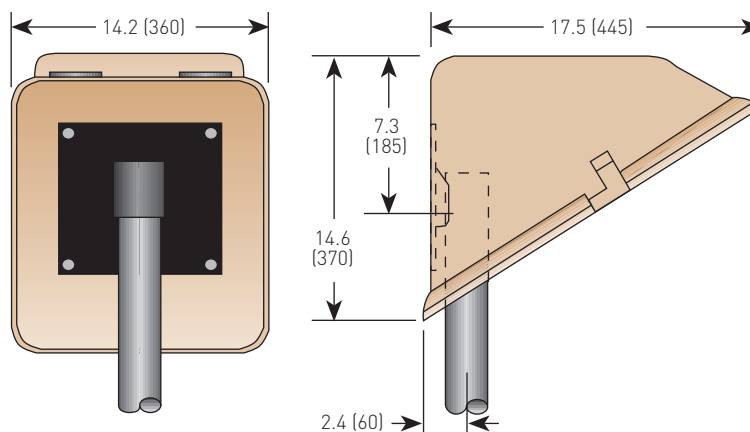


5S

A standard shade for single instrument applications such as differential pressure or pressure transmitters, pressure switches and controllers.

Approximate weight: 11.0 lb (5.0 kg)

DIMENSIONS, INCHES (mm)



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

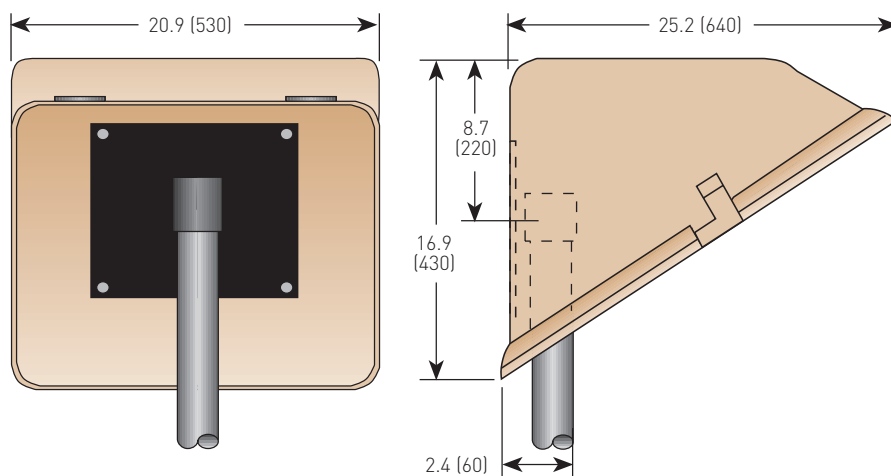
INSTRUMENT SHADES

155

A medium sized shade suitable for protecting chart recorders, dual transmitters or large transmitters.

Approximate weight: 20.0 lb (9.0 kg)

DIMENSIONS, INCHES (mm)

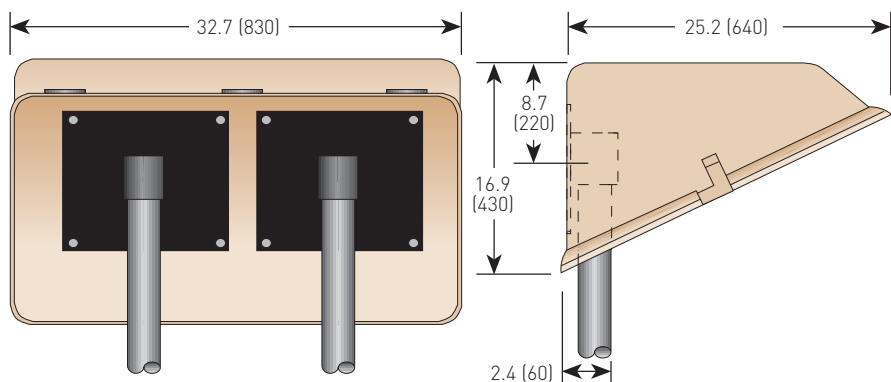


245

Larger shade used to safeguard multiple instrument applications and small analyzers.

Approximate weight: 37.4 lb (17.0 kg)

DIMENSIONS, INCHES (mm)



ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

ORDERING INFORMATION

SELECTION GUIDE

Example:		15L	AS.I W	EM5HIS-4	SG	TSA5	G3
Field 1: Enclosure type							
5L	Small enclosure						
15L	Medium enclosure						
24L	Large enclosure						
Field 2: Enclosure options							
AS	Anti-static						
I	Insulated						
W	Window						
BS	316 Stainless steel baseplate						
S	316 Stainless steel backplate and collar (sunshade only)						
Note: These codes may be used together e.g.: AS.I Anti-static, Insulated.							
Field 3: Manifold type							
See table on page 29 for field 3 Manifold type							
Field 4: Manifold options							
AT	Anti tamper bonnet	LB	Low back mounted in enclosure				
K	Key for anti tamper	SG	NACE MR0175 latest revision				
LAT	Lockable anti tamper bonnet	OC00	Degreased for oxygen service				
PD	Padlock for LAT	SSB	High tensile stainless steel bolts (ASTM A193 B8M.CL2)				
ISH	Steam heating channel	SSC	Stainless steel bolts (ASTM A193 B8M)				
CB	Ceramic ball tip	MA	½ NPT Female manifold adaptor				
ST	Stellite ball tip	VMA	½ NPT Female vertical manifold adaptor (EM2 only)				
R3V	Bolt kit for Rosemount 3051C transmitter	MMA	½ NPT male manifold adaptor				
HB	High back mounted in enclosure						
Field 5: Heater options							
See table on page 29 for detailed heater options							
Field 6: Accessory options							
WMSV	Wall mounting straps vertical - carbon steel	M20B	M20 brass cable gland (8 - 10 mm) diam.	BMP	Back mounting plate - carbon steel		
WMSH	Wall mounting straps horizontal - carbon steel	M20N	M20 nylon cable gland (8 - 10 mm) diam.	BMPS	Back mounting plate - 316 stainless steel		
WMSVS	Wall mounting straps vertical - stainless steel	PG11B	PG11 brass cable gland (6 - 9 mm) diam.	PS1M	2-inch NB pipestand 39-inch (1 m) - carbon steel		
WMSHS	Wall mounting straps horizontal - stainless steel	PG11N	PG11 nylon cable gland (6 - 9 mm) diam.	PS15M	2-inch NB pipestand 59-inch (1.5 m) - carbon steel		
L	Padlock bracket including padlock	PG135B	PG13.5 brass cable gland (8 - 12 mm) diam.	PS1MS	2-inch NB pipestand 39-inch (1 m) - 316 stainless steel		
UD	'U'-drain in base of enclosure	PG135N	PG13.5 nylon cable gland (8 - 12 mm)	PS15MS	2-inch NB pipestand 59-inch (1.5 m) - 316 stainless steel		
LH	Lifting handle on enclosure lid	PG16B	PG16 brass cable gland (11 - 14 mm) diam.	PS1MT	2-inch NB pipestand 39-inch (1 m) - carbon steel (twin for 24L)		
GPB	GRP gland plate (200 mm x 77 mm)	PG16N	PG16 nylon cable gland (11 - 14 mm) diam.	PS15MT	2-inch NB pipestand 59-inch (1.5 m) - carbon steel (twin for 24S)		
SGP	Split gland plate (inc. split G2 grommet)	PG21B	PG21 brass cable gland (14 - 16 mm) diam.	PS1MST	2-inch NB pipestand 39-inch (1 m) - stainless steel (twin for 24L)		
LR	Stainless steel louvre (150 mm x 100 mm)	PG21N	PG21 nylon cable gland (14 - 16 mm) diam.	PS15MST	2-inch NB pipestand 59-inch (1.5 m) - stainless steel (twin for 24S)		
VR	GRP ventilator	IPS	2-inch NB internal pipestand - carbon steel	TT	Tag traffolyte		
G1	Rubber grommet (5 - 7 mm) diam.	IPSS	2-inch NB internal pipestand - 316 stainless steel	TS	Tag stainless steel		
G2	Rubber grommet (7 - 10 mm) diam.	VMP	Vertical mounting plate - carbon steel				
G3	Rubber grommet (10 - 14 mm) diam.	VMPS	Vertical mounting plate - 316 stainless steel				
G4	Rubber grommet (14 - 20 mm) diam.						
G5	Rubber grommet (20 - 26 mm) diam.						
G6	Rubber grommet (26 - 35 mm) diam.						

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

ORDERING INFORMATION

FIELD 3 MANIFOLD TYPE

Example:	EM5	H	I	S	- 4
Manifold type					
Connection outlet x inlet					
EM2 Flange x thread two-valve manifold					
EM2T Thread x thread two-valve manifold					
EM3 Flange x thread three-valve manifold					
EM5 Flange x thread five-valve manifold					
EM2F Flange x flange two-valve manifold					
EM3F Flange x flange three-valve manifold					
EM5F Flange x flange five-valve manifold					
Gland packing					
V PTFE					
H Graphite (Grafoil®)					
Seat type					
I Integral					
Material					
S Stainless steel					
Process connections					
-4 ½ NPT Female					
Omit Flange (EM2F, EM3F, EM5F)					

FIELD 5 HEATING OPTIONS

Combinations - Hazardous areas				
Code	Heater wattage	Type	Junction box	Thermostat
FSA5	100	Finned	PJB1	FFT
FSA7	200	Finned	PJB1	FFT
FSA0	500	Finned	PJB1	FFT
FSD5	100	Finned	PJB2	(None)
FSD7	200	Finned	PJB2	(None)
FSD0	500	Finned	PJB2	(None)
FSE5	Consult factory			
FSE7	Consult factory			
FSE0	Consult factory			
MHF9	100	Direct (EM manifold)	PJB2	(None)
Combinations - Non-hazardous areas				
E5G	100	Industrial	IT	Adjustable
E500	500	Industrial	IT	Adjustable
Individual components - Hazardous areas				
Code	Heater wattage	Type	Material	
FHA-100	100	Finned	Aluminum	
FHA-200	200	Finned	Aluminum	
FHA-500	500	Finned	Aluminum	
MH-B3	100	Direct heater (EM manifold)		Aluminum
PJB1/FFT	Plastic junction box with fixed thermostat			
PJB2	Plastic junction box			
BST	Consult factory			

Individual components - Non-hazardous areas		
EH5	100 watt industrial heater	
EH-500	500 watt industrial heater	
IT	Non-hazardous adjustable thermostat (plastic)	
Individual components - Steam coils (with tube fittings)		
Code	Size	Material
XSCU25	¼" OD	Copper
XSCU38	¾" OD	Copper
XSS25	¼" OD	Stainless steel
XSS38	¾" OD	Stainless steel

ANDERSON GREENWOOD INSTRUMENT ENCLOSURE SYSTEMS

DESIGN AND MANUFACTURING CAPABILITIES

Full systems capability

Designed and engineered to combine ease of on-site installation with efficient and reliable in-service operation, Anderson Greenwood instrument protection systems provide the complete solution.

Design service

Our dedicated design team has the specialist knowledge and skill to layout instrument systems with the optimum use of space within each enclosure.

- Complete enclosure design service based on customer applications, process conditions, instruments to be installed and heating requirements.
- Pre-production drawings for customer review and approval.
- As-built drawings for final documentation.

A wealth of experience gained from many years of 'fitting out' instrumentation is the basis of a service which reduces on-site installation time and costs and ensures each enclosure reaches its destination safely.

Full assembly and instrument fitting

Customer's free-issue instruments can be fitted into a range of enclosures, with the complete package supplied fully assembled direct to site. This enables all process connections to be made simply and easily through a service plate in the back or base of the enclosure and negates the need for extra drilling on site.

- Installation (and pressure testing⁽¹⁾) of free-issued customer instruments or equipment.
- Installation (and pressure testing⁽¹⁾) of tube, fittings and manifolds.
- Tagging of all enclosures and instruments in accordance with customer tag list.
- Installation of electrical heaters, thermostats, junction boxes, cable glands and grommets.
- Wiring of all electrical connections by qualified technicians.
- Installation of all internal and external brackets.

NOTE

1. Pressure testing of installed components can be provided; please contact the factory for details.

