

Conoflow



ITT Industries

Engineered for life

INSTRUCTION AND MAINTENANCE MANUAL HP550 HIGH PRESSURE REGULATOR STEAM-VAPORIZING

WARNING
Conoflow's products are designed and manufactured using materials and workmanship required to meet all applicable industry standards. The use of these products should be confined to services specified and/or recommended in the Conoflow catalogs, instructions or by Conoflow application engineers (i.e. exceeding pressure temperature rating or using device for services other than those specified).
To avoid personal injury or equipment damage due to misuse or misapplication of a product, it is necessary to select the proper materials of construction and pressure temperature ratings which are consistent with performance requirements.

These instructions should be read carefully before installation or maintenance

GENERAL

The HP550 Series Regulator is a self-contained, diaphragm sensed, steam heated vaporizing high-pressure regulator. This unit is designed for use in the vaporization and vapor pressure control for sampling of process fluids.

MATERIALS OF CONSTRUCTIONS

The HP550 will operate with any fluid (liquid or gas) which is compatible with the materials of construction. To identify the materials of construction, refer to Control Engineering Data contained on Page 2.

Body	316L Stainless Steel
Bowl	316L Stainless Steel
Bonnet	316 Stainless Steel
Main Valve Seat	Vespel
Diaphragm and Trim	Elgiloy / 316SS
Filter	316 Stainless Steel (25 micron)

REGULATOR CLEANING

The HP550 Series High Pressure Regulator is cleaned to ITT Conoflow Specification ES8A 01 294.

CAUTION: Maximum Supply Pressure
Stainless Steel 1500 PSIG (10.35 MPa)

An internal filter screen is provided in the inlet ("IN") port only to stop random contamination resulting from installation. An auxiliary filter is recommended for all but the cleanest fluid. Gaseous fluid must be free of excessive moisture to prevent internal icing or condensation during operation.

OUTLET PRESSURE RANGES

OPTION CODE	RANGE
"A"	4-25 PSIG (0.03-0.173 MPa)
"B"	4-50 PSIG (0.03-0.345 MPa)
"C"	5-100 PSIG (0.04-0.690 MPa)
"E"	6-250 PSIG (0.04-1.730 MPa)
"F"	10-500 PSIG (0.069-3.450 MPa)

PORTING CONFIGURATIONS

The HP550 Regulator has a 1/8" NPT Inlet port with the outlet and two steam ports being 1/4" NPT. The inlet port (supply connection) is labeled "IN", the outlet port is labeled "OUT" and the two steam ports are labeled "STEAM". Port markings are stamped next to the appropriate port. CARE should be exercised when installing the high pressure line to assure it is connected to the inlet ("IN") port, otherwise the regulator will not function properly.

Teflon thread tape is the preferred thread sealant when the regulator is installed.

CONTROL ENGINEERING DATA

Control Engineering Data is intended to provide a single source from which one can determine, in detail, the full scope of the product line. In addition to materials of construction, diaphragm and elastomer selection, it also provides all necessary data, regarding adjustment options and range selections. Control Engineering Data also provides a means of communicating by way of a code number which is fully descriptive of the product selection.

Note 1. All Catalog Numbers as received must contain fifteen (15) characters.

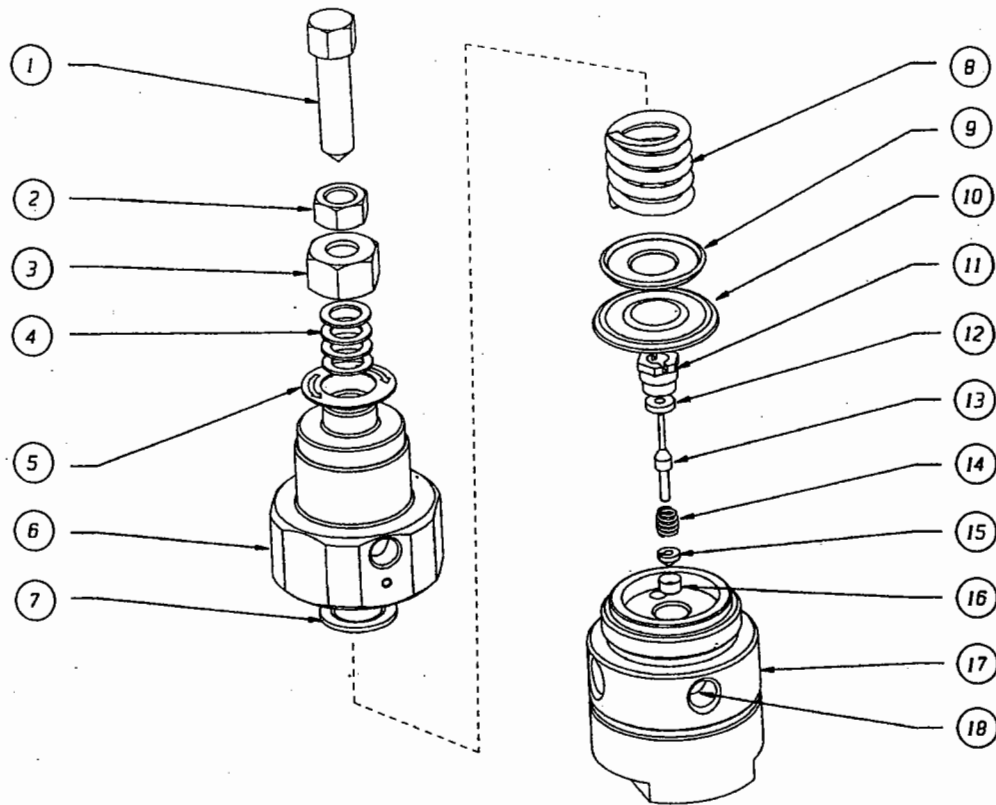
1-5 Model	HP550 Pressure Reducing Regulator Vaporizing Regulator
6 Materials of Construction	Body/Bonnet/Trim L = 316LSS/316SS/316SS
7-8 Elastomer & Diaphragm	Diaphragm Main Valve Seal 16 = Elgiloy/Vespel
9 Relieving Option	N = Non-Relieving/Captured Bonnet
10-11 Inlet/Outlet/Ports	Inlet/Outlet/Steam Ports (No Gauge Ports) NI = 1/8" NPT Inlet - 1/4" NPT Outlet 2 - 1/4" NPT Steam Ports
12 Mounting	S = Line Mounting (Standard) P = Panel Mounting (2-nut) (Optional)
13 Cleaning	A = Regulators are cleaned to ITT Conoflow Specification ES8A 01 294
14 Adjustment Selection	K = Wrench Knob with locking device (Standard) T = "T" bar handle (Optional)
15 Control Setting Ranges	A = 4-25 PSIG (0.03 - 0.173 MPa) B = 4-50 PSIG (0.03 - 0.345 MPa) C = 5-100 PSIG (0.04 - 0.690 MPa) E = 6-250 PSIG (0.04 - 1.730 MPa) F = 10-500 PSIG (0.069 - 3.450 MPa)

INSTALLATION

The HP550 Regulator can be line or panel mounted. For panel mounting configuration and for port orientation, refer to dimensional data contained on Page 6.

WARNING

DO NOT ENGAGE REGULATOR OUTPUT ADJUSTMENT UNTIL SUPPLY PRESSURE IS APPLIED.



ITEM NO.	DESCRIPTION	QTY. REQ'D	PART NO.
1	Adjustment Mechanism		
	Knob (Wrench Style)	1	G6020614
	T ^h Handle	1	71140S3
2	Jam Nut	1	75850NB
3	Packing Nut	1	71761NB
4 (2)(3)	Packing Washers	4	71760TF
5	Label - Increase / Decrease	1	76607AL
6	Bonnet	1	71250S6
7	Spring Button	1	71550S6
8 (1)	Range Spring		
	A = 4-25 PSIG (0.03 - 0.173 MPa)	1	72159S2
	B = 4-50 PSIG (0.03 - 0.345 MPa)		72160S2
	C = 5-100 PSIG (0.04 - 0.690 MPa)	1	72157CE
	E = 6-250 PSIG (0.04 - 1.730 MPa)	1	72158CE
F = 10-500 PSIG (0.069 - 3.450 MPa)	1	72140CE	
9	Diaphragm Plate	1	72951S6
10 (1)(2)(3)	Diaphragm - Non-Relieving	1	74150LG
11 (2)	Seat Gland	1	73550S6
12 (2)(3)	Main Valve Seat - Vespel	1	73650VP
13 (2)	Main Valve Plug	1	73150S6
14 (2)	Plug Spring	1	72550S6
15 (2)(3)	Inner Friction Bushing	1	73400TFP
16 (2)	Outer Friction Bushing	1	73401S6
17 (4)	Body	1	70555SLSA
18 (2)(3)	Filter Element / Installed in Inlet Port (25 Micron)	1	73855S6
19	Panel Mounting Nuts / Not Shown	2	76201SN
20	Warning Sticker / Not Shown	1	76625

NOTES:

- CONTROL KITS, Consist of Items 8 and 10.
 4-25 PSIG (0.03 - 0.173 MPa) 83550-16
 4-50 PSIG (0.03 - 0.345 MPa) 83551-16
 5-100 PSIG (0.04 - 0.690 MPa) 83552-16
 6-250 PSIG (0.04 - 1.730 MPa) 83553-16
 10-500 PSIG (0.069 - 3.450 MPa) 83554-16
- OVERHAUL KIT (All Ranges), Consist of Items 4, 10, 11, 12, 13, 14, 15, 16, and 18. - Part Number 81550-16
- MAINTENANCE KIT (All Ranges), Consist of Items 4, 10, 12, 15, and 18. - Part Number 80550-16
- When ordering a body (17), specify the complete model number of the regulator. Electrochemical marking is performed, so correct information is necessary.

WARNING - TECHNICAL DATA SUBJECT TO EAR CONTROLS

This document contains technical data whose export is restricted by the Export Administration Act of 1979, as amended (Title 50, U.S.C., App. 2401, et seq.) Violation of this export control law is subject to severe criminal penalties.

SCHEDULED MAINTENANCE

All regulators require scheduled maintenance to remove deposits left by the media and to replace parts worn or damaged as a result of use. Annual maintenance is recommended when the regulator is used under normal conditions. More frequent maintenance may be required due to the condition, cleanliness and/or corrosiveness of the media.

TOOLS REQUIRED

7/16" Socket (seat gland)
1/2" Open or box wrench (wrench knob)
9/16" Socket (jam nut)
9/16" Open end wrench (jam nut on wrench knob or "T" handle)
3/4" Open end wrench (packing nut)
1-7/8" Wrench or socket (bonnet)
Christo-Lube MCG136 lubricant
Other possible tools would be vise, tweezers, clean lint-free cloth and a torque wrench.

CAUTION - MAINTENANCE

It is recommended that maintenance be performed by a person experienced in the operation and repair of high pressure regulators.

Maintenance of this unit is best performed with the regulator clamped in a vise. Securing the regulator in a vise can be at the flats on the regulator body or by gripping a protruding end of a pipe fitting installed into the regulator body.

WARNING: Bleed System Pressure Prior To Removing Regulator For Servicing.

MAINTENANCE PROCEDURE

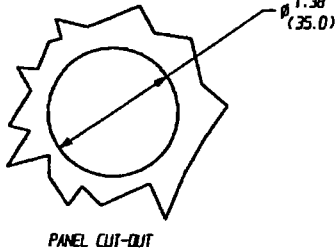
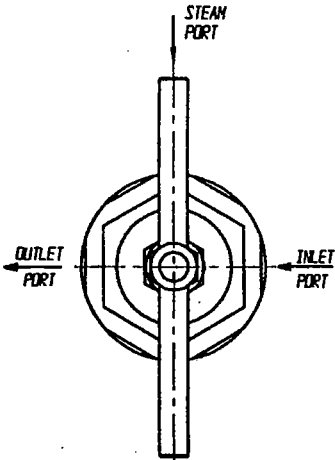
1. Adjust knob (or "T" Handle (1) counterclockwise until the adjustment mechanism is disengaged. At this point, the range spring (8) and Spring Button (7) will rattle slightly.
2. While holding the adjustment screw (1) from turning, use a 3/4" open end wrench to loosen the packing nut and rotate until all threads are disengaged from the bonnet (6).
3. Remove the adjustment screw, packing washers and packing nuts as an assembly. Do not disassemble, unless necessary to replace the packing washers.
4. Secure the regulator in a vise. Using 1-7/8" socket and wrench, loosen and remove the bonnet (6).
5. Remove the spring button (7), range spring (8), diaphragm plate (9), and diaphragm (10).
6. The main valve assembly can be disassembled by using a 7/16" socket to turn the seat gland (11) counterclockwise until it is free from the regulator body (17). The main valve seat (12), main valve plug (13), and the plug spring (14) can be lifted from the body (17). The inner and outer friction bushings (15)(16) can be removed from the body by either just inverting the body (if the bushings are loose), or by carefully easing them out with a long, thin instrument inserted in the center holes.
7. Remove the main valve seat (12) from the seat gland (11).

THE REGULATOR IS REASSEMBLED IN THE REVERSE ORDER OF DISASSEMBLY, OBSERVING THE FOLLOWING PRECAUTIONS:

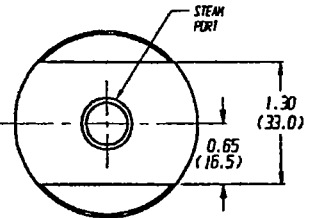
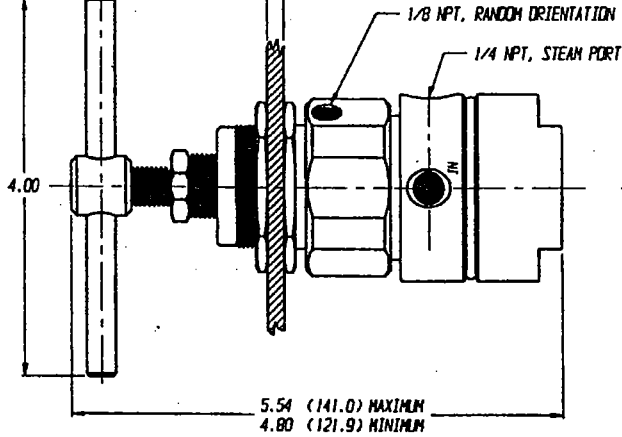
1. Inspect all component parts and replace those worn or damaged with ITT Conoflow replacement parts.
2. All component parts should be cleaned to the cleanliness level required for safe operation with the media used. All parts in the flow stream must be free of particles, which could prevent proper seating of the main valve. The steam port and cavity should be cleaned of any debris buildup.
3. Place the outer friction bushing (16) in the 1/4" center hole of the body with the countersunk side up.
4. Place the plug spring (14) on the main valve plug (13) so it mates with the shoulder. Slide the inner friction bushing (15) on the main valve plug (13) with the flat side against the plug spring (14). Holding the main valve plug by the smaller diameter end, slide the three components into the body on top of the outer friction bushing (16).
5. Lubricate the threads of the seat gland (11) lightly. Snap the main valve seat (12) into the seat gland (11).
6. Place the seat gland (11) and main valve seat (12) assembly over the main valve plug (13) and screw the seat gland into the body. Torque the seat gland to 150 inch-pounds.
7. Turn the bonnet (6) over and lubricate the large chamfer in the bonnet and the threads. Place a tab of lubricant in the well of the spring button (7).
8. Place diaphragm (10) on body (17) so it is centered. Place diaphragm plate (9), range spring (8) and spring button (7) on the diaphragm as illustrated.
9. Place the bonnet (6) over the parts listed in Step 8 and screw hand tight. When the bonnet (6) tightens, be sure the diaphragm (10) does not shift off center.
10. Secure the body in a vise by the wrench flats on the bottom, and torque the bonnet to 150 foot-pounds. ***This is critical as the regulator relies on a metal-to-metal seal to contain the outlet pressure.***
11. Place the increase/decrease label (5) onto the bonnet (6).
12. If necessary, press four packing washers (4) into packing nut (3). Note that packing nut threads are exposed after installation of last packing washer.
13. Apply wicking type, non-permanent thread lock compound to the threads of the packing nut (3).
14. Lubricate the adjustment screw (1) and jam nut (2) and thread onto the packing nut (3), one half to one quarter of its length.
15. Thread the adjustment screw (1) into the bonnet (6) until threads are sufficient to hold it in place.
16. By hand, thread the packing nut (3) onto the bonnet and torque to 70 inch pounds using deep socket or crow's foot adapter. Back off the packing nut (3) until the adjustment screw (1) turns freely, but maintains enough pressure to hold an adjustment. Do not engage the adjustment screw fully at this time.
17. Press in a new filter element (18) in the inlet port of the body (!7), using a 1/4" nut driver, socket or similar tool with a hollow center, approximately 0.30" in diameter. Exercise care not to apply excessive pressure to the filter, just enough so that it seats in the port. ***Do not "hammer" the filter in place.***

FOR CERTIFIED DIMENSIONAL DRAWING, REFER TO HP550-C2

SHOWN WITH OPTIONAL T-BAR HANDLE
SEE CED SHEET FOR ORDERING INFORMATION



PANEL - REF.
0.18 (4.6) THICK WITH 2 LOCKNUTS
0.50 (12.7) THICK WITH 1 LOCKNUT
PANEL MOUNTING NUTS OPTIONAL
SEE CED SHEET FOR ORDERING INFORMATION

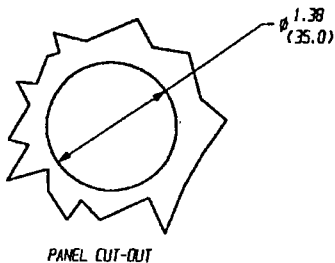
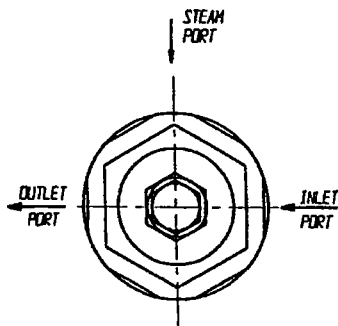


() DIMENSIONS IN MILLIMETERS

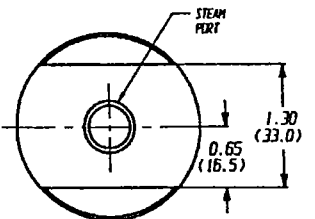
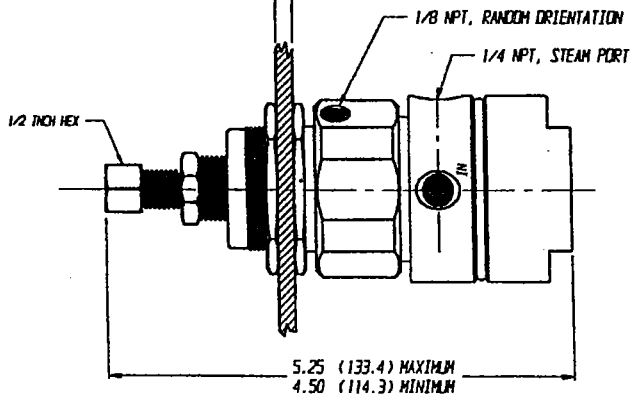
PORT(S)	INLET	OUTLET	STEAM
CONNECTION SIZE	1/8" NPTF	1/4" NPTF	1/4" NPTF

FOR CERTIFIED DIMENSIONAL DRAWING, REFER TO HP550-C3

SHOWN WITH STANDARD WRENCH KNOB
SEE CED SHEET FOR ORDERING INFORMATION



PANEL - REF.
0.18 (4.6) THICK WITH 2 LOCKNUTS
0.50 (12.7) THICK WITH 1 LOCKNUT
PANEL MOUNTING NUTS OPTIONAL
SEE CED SHEET FOR ORDERING INFORMATION



() DIMENSIONS IN MILLIMETERS

PORT(S)	INLET	OUTLET	STEAM
CONNECTION SIZE	1/8" NPTF	1/4" NPTF	1/4" NPTF

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TROUBLE SHOOTING

When performing necessary corrective actions in the following operations, refer to the MAINTENANCE section for the necessary procedure.

PROBLEM:

The regulated pressure continues to increase after lock-up without a change in control knob position.

POSSIBLE CAUSE:

Main valve seat (12) is dirty or worn and needs replacement, follow instruction in maintenance section.

PROBLEM:

Leakage through or around the edge of bonnet.

POSSIBLE CAUSE:

Insufficient torque on bonnet (6). Re-torque to 125-150 ft. lbs. If leakage persists, disassemble the regulator per instruction in maintenance section and inspect body for nicks and scratches on the radius where the diaphragm seats against the body. Replace body if nicked. Replace the diaphragm and reassemble the regulator. After reassembly, torque bonnet to 150 ft. lbs.

PROBLEM:

Regulated pressure drops off sharply even when flow is within the regulator capabilities.

POSSIBLE CAUSE:

Clogged inlet filter (20). Carefully remove old filter with sharp instrument or needle nosed pliers. Press in new filter using a 1/4" nut driver, socket or similar tool with a hollow center and a 0.30" diameter. Exercise care not to apply excessive pressure to the filter, just enough so that it seats in the port. **Do Not "hammer" the filter in place.**

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