



Installation, Operation and Maintenance Manual

Electronic Condensate Drain

20-606

20-613

20-623



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Manufacturer's Declaration

***Parker Hannifin Corp., Filtration and Separation Division,
242 Neck Road
Haverhill, MA 01835***

herewith declares that the products

electronic condensate drain models 20-606, 20-613, 20-623

- are ETL listed
- conform to ANSI/UL STD 508
- are certified to CAN/CSA STD C22.2 NO.14



FCC Compliance

The condensate drain series ZLD-006 to ZLD-330 is, according to the manufacturer/applicant, primarily intended for use in industrial plants as "digital devices" and "unintentional radiators". Therefore the drain series falls under the category of exempted devices, according to FCC, CFR 47, 915.103 b).

Only the general requirement that a device must not emit electromagnetic disturbances are to be fulfilled, and fulfilment is confirmed through an EMC report according to the European EMC requirements for the CE mark.

General Information

About this operating manual

Signs and symbols

- ▶ Procedures that must be completed in the indicated sequence are numbered.
- Items in lists are highlighted with grey boxes.

Note:

Always comply with these instructions to ensure safe and efficient operation of the machines and devices.



Caution!

These safety notes help prevent damage to property and must always be adhered to.



Danger!

These danger notes with a grey background warn against personal injury and/or danger to life and limb; danger notes help you to avoid serious or life-threatening situations for yourself and/or third parties.

Target group of these operating instructions

This operating manual is intended for all persons who work with the condensate drain. We assume that these persons have technical qualifications, e.g. as pipe-fitters or electricians.

About your safety

Please observe the following general safety instructions:



Caution!

All maintenance work must be completed by suitably qualified and authorized specialist personnel.



Risk of injury from escaping compressed air!

Never remove any parts of the condensate drain or perform any maintenance as long as the unit is pressurized! Rapidly escaping compressed air can cause serious injuries.

Prior to any work, depressurize the unit, and verify that it has been depressurized.



Warning! Risk of injury from electrical voltage

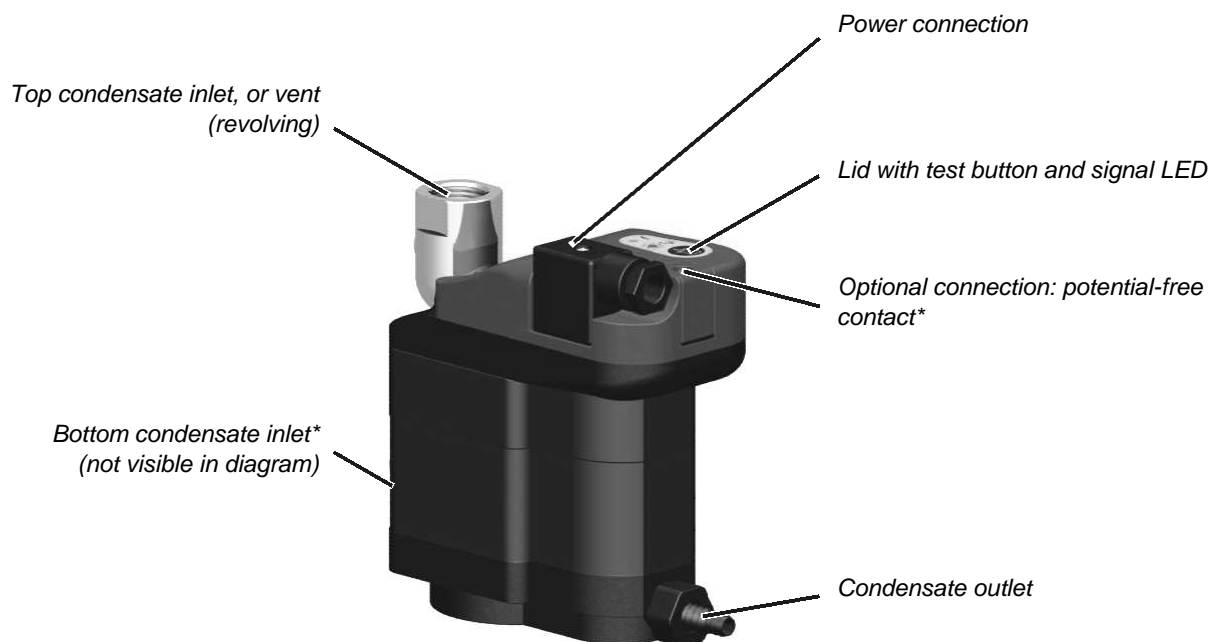
All work on electrical components must be carried out by suitably qualified specialist personnel!

Proper use of the condensate drain

The condensate drain must only be used for the removal of standard condensates (condensed water and liquid oil) from compressed air systems. Any other use is deemed improper.

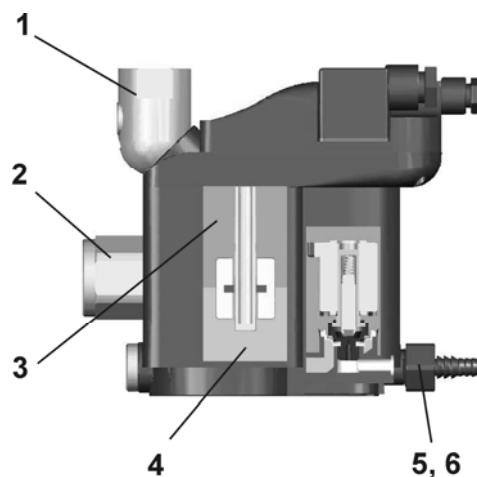
Technical Description

Overview



* not available in model 20-606 and 20-613

Function



The condensate enters the unit through the inlet (1 or 2) and collects in the collecting chamber (3). When the collecting chamber is completely filled with condensate (4), the condensate is drained through the outlet (5) until the chamber is emptied. An integrated flow regulator (6) prevents rapid depressurization when the valve is opened, ensuring smooth and quiet drainage of the condensate.

The different condensate drain statuses are indicated by an LED in green, orange and red. A green LED indicates normal and trouble-free operation. An orange LED indicates that no condensate has been drained for a period of 15 hours. After condensate has been drained off, the LED changes to green.

The LED flashes slowly in red if the condensate cannot be drained off within the set time and an internal cleaning program has been started. After successful cleaning the drain returns to normal operating mode. If the cleaning program cannot be completed successfully, an emergency program is started and an alarm signal is issued (LED flashing rapidly in red).

Installation



All work at the pipelines and on the electrical components must be carried out by authorized and suitably qualified technical personnel.

Requirements for installation

For proper installation of the condensate drain, the operator must provide the following:

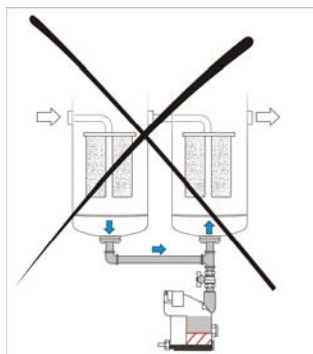
- Proper connections and lines for the condensate inlet and outlet. For a list of connection sizes, please refer to the technical data on page 17.
- All lines and connections must be adjusted to the actual operating pressure.
- Use only ball valves as shut-off valves.
- Ensure that the condensate drain is connected to the correct electrical voltage.

Basic requirements for installation

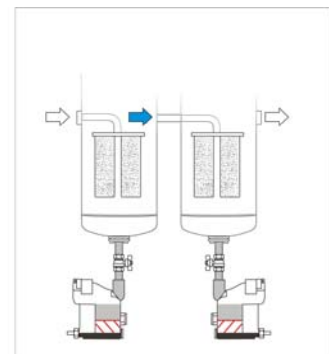
When installing the condensate drain, observe the following general instructions:

Avoid plumbing multiple condensate lines into one drain!

If condensate needs to be drained at several locations, separate condensate drains should be used. Otherwise, undesired flow will occur.



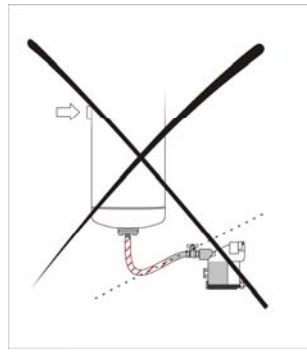
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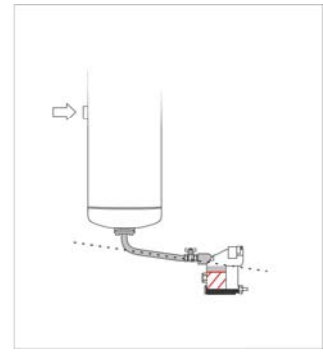
correct

Observe downward slope into the condensate drain!

Ensure that the condensate line entering the drain is properly sloped in a downward manner. Otherwise, an air bubble might prevent condensate from entering the drain.



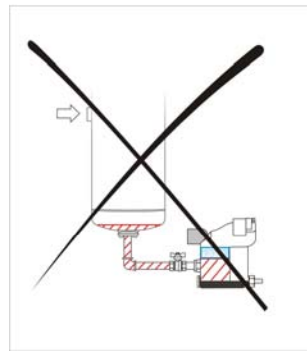
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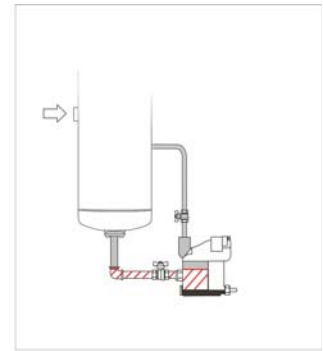
correct

Install vent line!

If the bottom condensate inlet is used, install a vent line. Otherwise, air bubbles trapped in the condensate inlet piping might prevent condensate from entering the chamber.



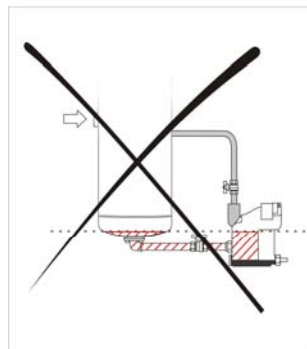
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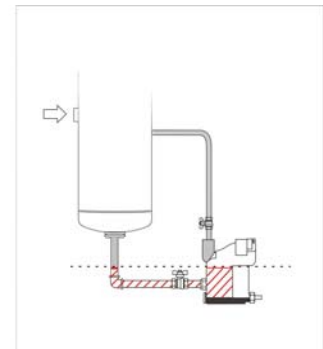
correct

Observe levels!

The switching level of the condensate drain must be lower than the vessel. Otherwise, condensate might be backed up in the vessel.



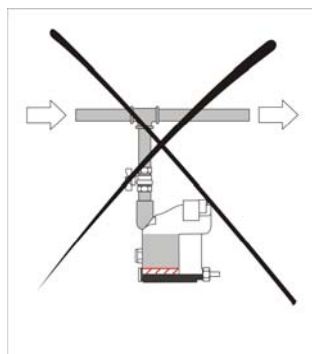
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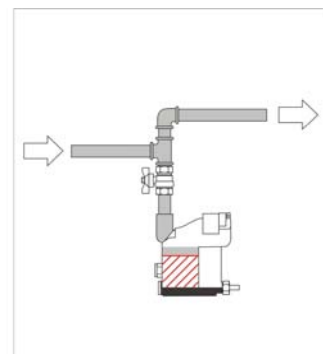
correct

Prevent carry-over of condensate!

Straight pipelines might lead to carrying over of condensate. Install suitable condensate traps (driplegs).



incorrect



correct

Connection of condensate inlet

20-606 and 20-613 are equipped with a top condensate inlet only, while model 20-623 has a revolving top inlet and a bottom inlet for condensate.

Note:

For installation, we recommend using the appropriate Parker installation kit consisting of a ball valve with fittings.

Use open-ended spanner!

Never turn the condensate drain to install it into the pipeline! Always use an open-ended spanner to install the condensate drain.



wrong



right

Installation of 20-606

- ▶ Under certain circumstances, the 20-606 can be mounted directly onto the filter bowl. Ensure that the drain is in vertical position (maximum permissible deviation from perpendicular: +/- 5 %).

The integrated vent ensures proper condensate inlet to the collection chamber.

Installation of 20-613 and 20-623

- ▶ Turn the upper inlet piece to the desired position:
 - Pull pin.
 - Turn inlet piece.
 - Push back pin.
- ▶ Select the condensate inlet connection to be used.
- ▶ Ensure that the drain is in vertical position (maximum permissible deviation from perpendicular: +/- 5 %).
- ▶ Connect condensate inlet connection to feed line. Install vent line, if required.
- ▶ Check connections for leakage.

Connection of condensate outlet

The condensate drain delivery includes a 0.3-0.4 in hose tail.

Note:

- The water column in the condensate outlet should not exceed 6.5 ft.
 - The condensate outlet lines should not be pressurized but open.
- Connect the condensate outlet to the condensate drain line.

Connection to power supply/potential-free contact



Warning! Risk of injury from electrical voltage

All work on electrical components must be carried out by suitably qualified technical personnel!

Model 20-623 is equipped with a potential-free contact, in addition to the main power connection (not available for 20-606 and 20-613). Model 20-623 therefore features two connections with matching adapters:

- Adapter for supply voltage: magnetic valve connector "type B plug" industrial standard (0.43 in) 2 + PE (see figure, item 1)
- Adapter for potential-free contact: magnetic valve connector "type C plug" industrial standard (0.37 in) 3 + PE (see figure, item 2)



Connection to supply voltage



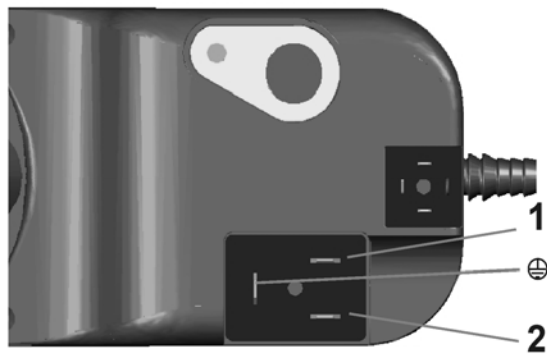
Beware of electric shock in case of a fault!

The drain features a ground connection. Its purpose is to provide a safety cut-out of the condensate drain in case of an error, provided that the drain is plugged into a ground fault circuit interrupter has been installed in the electrical line.

Otherwise there is the risk of an electric shock in case of moisture penetration.

We absolutely recommend that you install a ground fault circuit interrupter in the power supply line prior to connecting the condensate drain.

- Attach type B plug to the cable. Observe pin assignment (see figure).



- 1 Supply voltage
- 2 Supply voltage
- ⊕ Earth ground

Type B plug supply voltage

- ▶ Push plug **with seal** into the power adapter of the drain and screw it tight.
- ▶ Install a ground fault circuit interrupter, and plug the drain into the ground fault circuit interrupter.
- ▶ In all phases the condensate drain must be connected to electrical lines that are protected against short circuits by means of fuses or circuit breakers.

Connection of potential-free contact

The connecting socket of the potential-free contact is protected by a cover.

- ▶ Remove the cover (1) (see figure to the right).
- ▶ Attach type C plug to the cable. Observe pin assignment (see figure below).



- 1 NO (normally open)
- 2 NC (normally closed)
- 3 Common
- ⊕ Earth ground (24 V only)

Type C plug: potential-free contact

Push plug **with seal** into the adapter of the potential-free contact and screw tight.

24 V connection

- ▶ Use a UL listed class 2 transformer to generate the low voltage for the 24 V power supply.

This will exempt the unit from a safety inspection in line with ANSI/UL or CAN/CSA.

Startup of the Condensate Drain

- ▶ Apply power to the drain.

The system initialization program is started. During this period, the LED flashes at short intervals. When the process is completed (after approx. 3 seconds) the green LED is constantly on.

- ▶ Pressurize the drain.
- ▶ Ensure that condensate enters the drain.
- ▶ Inspect connections for leakage.
- ▶ Press the test button to open the valve. If you can hear a low flowing noise, your drain is working properly.

The condensate drain is now ready for operation.

If the potential-free contact is used: complete function test

The potential-free contact is a standard integrated feature of the condensate drain (not in model 20-606 and 20-613). To complete a function check at the contact, proceed as follows:

- ▶ Disconnect the unit from the power supply.
If there is an alarm signal, the potential-free contact is working properly.
- ▶ Reconnect the unit to the power supply.

Note:

The internal relay of the potential-free contact is normally activated when power is applied, and inactivated in alarm mode.

Monitoring of the Operation



Danger of slipping!

Water will condense on the drain's outside when the condensate in the drain is colder than the environment.

A puddle may form underneath the condensate drain if the condensed water drops to the ground. Use an appropriate collecting device to reduce the danger of slipping.

Note:

The unit is not equipped with an ON/OFF switch and it must be constantly connected to the power supply at all times (including weekends). Disconnection is only permitted for maintenance purposes. When the power supply is interrupted, the condensate drain issues an alarm signal.

The condensate drain is a fully automated device. Its operation and statuses can be monitored by observing the LED, so that disruptions and malfunctions are immediately detected. The LED signals and their significance are listed in the table below.

LED colour	LED signal	Description
green	flashing at long intervals	Valve active, condensate is being drained
	permanently on	Drain ready for operation
orange	permanently on	Warning signal (<i>not</i> an alarm signal): No condensate has been drained for 15 hours
red	flashing at long intervals	Cleaning program activated
	flashing at short intervals	Emergency program activated (alarm)
	permanently on	System error (alarm), drain defective

Test button

The test button is used to

- open the valve manually;
- release the pressure from the condensate drain.

The table below provides an overview of the test button functions:

Interval and action	Response
Press and release test button	Valve opens and closes
Press and hold test button for max. 3 seconds	Valve opens and closes
Press and hold test button for more than 3 seconds	Valve opens and closes automatically after 3 seconds
Press and hold test button for 5 seconds (alarm reset)	Valve remains closed; LED flashes fast in green: all alarms are reset.

Malfunction of the condensate drain

Malfunctions or failure of the drain are indicated by

- red LED, flashing at long intervals
- red LED, flashing at short intervals
- red LED, permanently on

If the condensate drain does not work properly, it is automatically cleaned. During the cleaning process, the red LED is flashing at long intervals, indicating that the program tries to remove contamination and unblock the lines by pumping. After successful cleaning, the drain is emptied and is then automatically reset to normal operation. If cleaning is not successful, the drain is switched to the emergency program, which is indicated by the red LED flashing at short intervals (alarm). If the red LED is permanently on, there is a system error. The condensate drain is defective and must be replaced.

Maintenance



Caution!

Maintenance work may only be carried out by authorized and suitably qualified technical staff. Prior to any maintenance work, depressurize the drain, verify that it has been depressurized, and remove the voltage source.

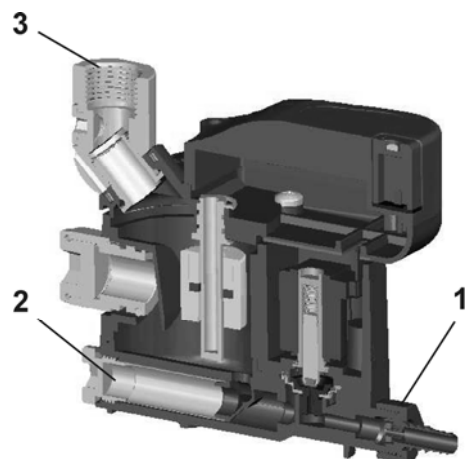
Cleaning of dirt screen (only necessary with highly contaminated condensate)

If condensate that is contaminated more than usual is drained, regularly clean the dirt screen.

- ▶ For this purpose, close the compressed air vent line and the condensate inlet.
- ▶ Repeatedly press the test button until no flow noise is audible (depressurizing the drain).
- ▶ Disconnect the power supply (remove the plug from the adapter).
- ▶ Dismantle condensate outlet by loosening nut (1) and pulling off the hose tail.
- ▶ Disconnect the drain:
 - 20-606:
remove the condensate drain with complete filter base. The condensate inlet can be turned.
 - 20-613 and 20-623:
Loosen optional screw connections and remove the drain.
- ▶ Loosen the screw of the dirt screen (2) and pull it out of the unit.
- ▶ Clean dirt screen.
- ▶ Rinse drain through the top condensate inlet (3) to remove any other dirt

In this way, all dirt can be removed without having to completely dismantle the entire condensate drain.

- ▶ Insert and secure dirt screen.
- ▶ Reinstall condensate drain in the system.
- ▶ Reconnect condensate outlet and power supply. Open the compressed air vent line and the condensate inlet.
- ▶ Restart the drain.



Sectional drawing of condensate drain

Annual maintenance

Every 8,000 operating hours or once every 12 months (whichever occurs first), a number of parts in the condensate drain must be replaced as a precaution (normal preventive maintenance). For this purpose, Parker has assembled the ZLD-SK service kit containing these replacement parts (seals, springs, etc.). When replacing these parts, strictly follow the instructions in the maintenance manual included in the service kit.

Technical Data

	Model			
	20-606	20-613	20-623	
Flow rate¹				
Compressor aftercooler (SCFM)	—	141	247	
Refrigeration dryer (SCFM)	—	282	494	
Filter ² (SCFM)	424	1410	2470	
Nominal flow rate (ft³/h)	0.035	0.074	0.13	
Operating pressure range	3–232 psig			
Temperature range	35–140 °F			
Electric data				
Supply voltage ³ (selectable)	115 V/50–60 Hz (UL version) 24 Vac/50–60 Hz 24 V DC (available on request)			
Potential-free contact ⁴	—	110 V DC, 250 V AC 1 A 30 W DC, 250 VA AC		
Power consumption: Standby Valve operation	1 VA 6 VA	1.8 VA 6.8 VA		
Protection class	IP 65			

¹ at 14.5 psi and 68 °F, operating pressure 100 psi, suction: compressor 77 °F at 60 % rel. humidity, compressed air outlet temperature at aftercooler 95 °F; refrigeration dryer dewpoint 37.4 °F

² Main condensate already drained from aftercooler or refrigeration dryer; only for residual oil or low condensate volumes arising from condensation.

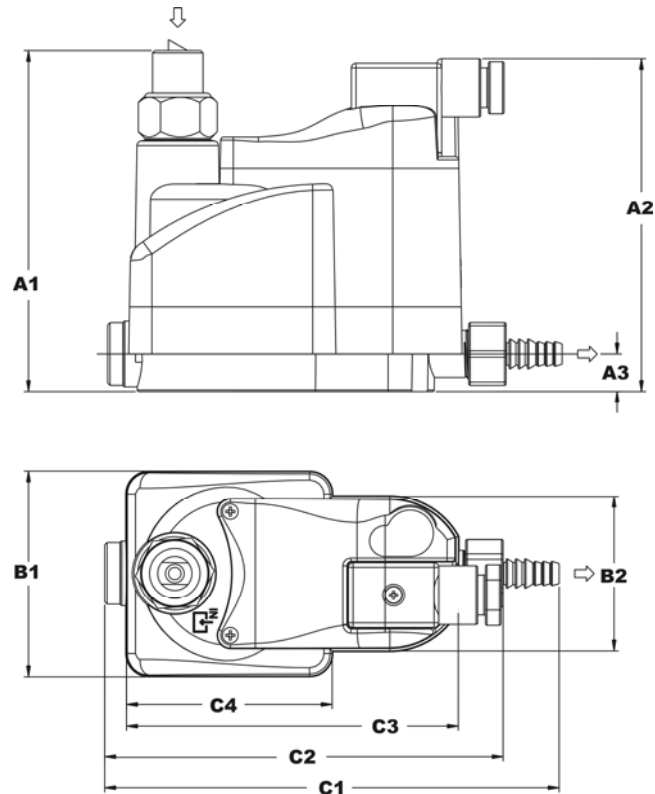
³ Magnetic valve connector type B industrial standard (0.43 in) 2+PE

⁴ Magnetic valve connector type C industrial standard (0.37 in) 3+PE

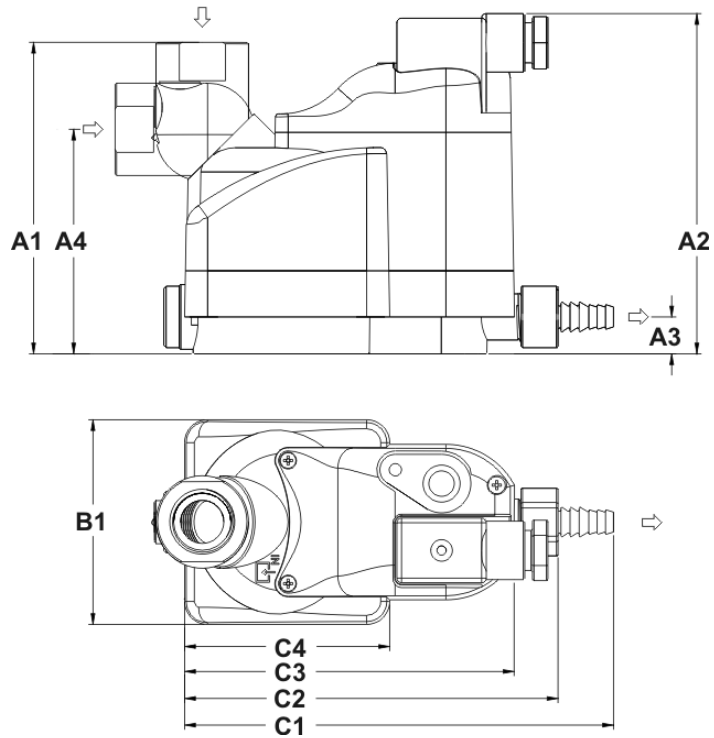
For dimensions and connection sizes, see dimensional drawings.

Dimension Drawings

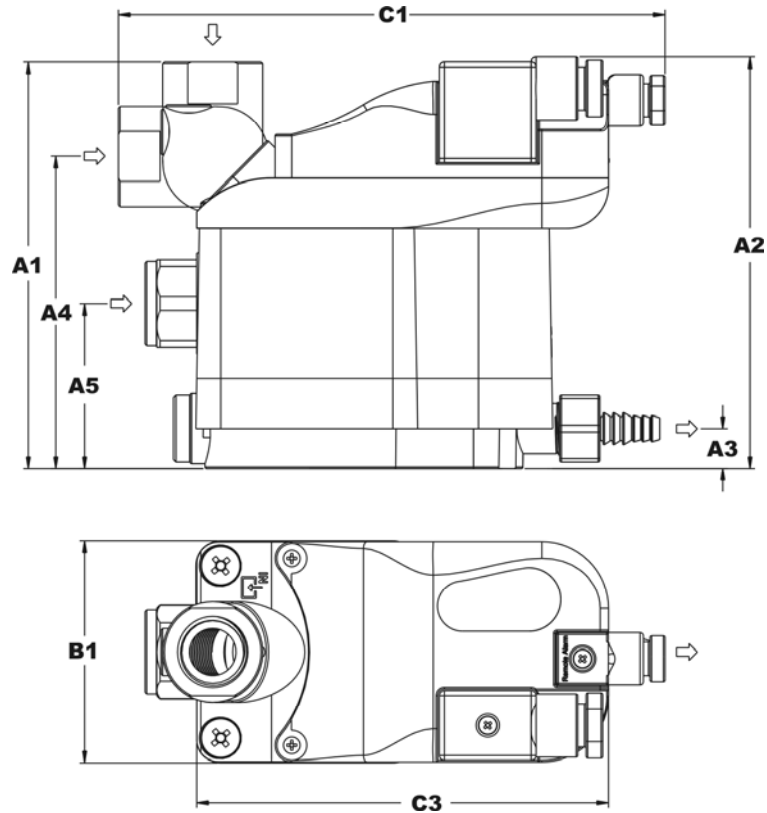
20-606



20-613



20-623



	Model				
	20-606	20-613	20-623		
Dimensions (in)					
A1	4.33	3.97	4.80		
A2	4.21	4.37	4.84		
A3	0.47	0.47	0.47		
A4	—	2.87	3.66		
A5	—	—	1.94		
B1	2.63	2.63	2.63		
B2	1.96	—	—		
C1	5.74	5.47	6.45		
C2	5.03	4.76	—		
C3	4.17	4.21	4.88		
C4	1.73	2.63	—		
Weight (lbs.)	1.10	1.32	2.20		

NPT connections at condensate inlet			
top inlet	3/8"		1/2"
vent	integrated in connection		1/8"
bottom vent	—	—	1/2"
Connection at condensate outlet			
	3/8" BSP or 0.3–0.4 in hose tail		



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