

Fluid Cooling Industrial COLW Series

0916

COPPER & STEEL CONSTRUCTION

Performance Notes

- Ideal for independent cooling and filtering of system oils
- Utilizes a high efficient EK series shell & tube (finned bundle) heat exchanger
- Wall or floor mount
- Low to medium pressure applications utilizing low noise screw pump technology
- Pump flows ranging 9.5 GPM to 45 GPM
- Standard SAE ports. NPT and BSP port adapters available



Options
Cartridge-style filters
Plugged filter indicators
Temperature sensors

Ratings

Maximum Operating Pressure - Shell Side

250 PSI (17 BAR)

Maximum Operating Pressure - Tube Side

150 PSI (10.3 BAR)

Maximum Operating Temperature

250° F (121°C) without filter

230° F (110°C) with filter

Maximum Viscosity

150 cst

Fluid Compatibility

Petroleum

Mineral oil HLP and HLVP

Ecologic fluids HETG-HEPG-HEE

Cutting oils (contact TTP)

Water/ethylene glycol (COLW-100 only)

Water-oil emulsions (COLW-100 only)

Water-Ethylene Glycol emulsions (COLW-100 only)

Materials

All Models

Pump Positive displacement (screw)

Pump Motor Nema frame

Shell Steel

Tubes Copper

Frame Powder-coated carbon steel

Gaskets Nitrile rubber/cellulose fiber

Mounting Brackets Steel

Nameplate Aluminum foil

COLW-20, 20W, 40, 40W, 80

Tube Sheets Steel

Baffles Steel

Fins Aluminum

End Caps Grey iron

COLW-100

Baffles Brass

Headers Steel

Shell Connections Steel

End Bonnets Grey iron

Screw Pump Technology

Offers significant maintenance and performance advantages.

Screw pumps meet the need of having a silent hydraulic component, unique pump design offers the characteristics of a gear pump and the silence of a screw pump.

- Reliable, high performance, low noise
- Run without pulsation, providing long life to your application
- Positive displacement rotary pump with axial flow design
- Only three moving parts
- Rolling action eliminates noise and vibration



Micron Filtration

Utilizes a modern in-line filter housing and cartridge

- Standard cartridge element
- Filter Options:
 - 10 micron fiberglass, standard
 - 3, 6, and 25 micron fiberglass, optional
 - Consult factory for high viscosity fluids
- B 1000 filtration efficiency
- Filtration indicator
 - Visual, visual/electrical or electrical

How to Order

	-		-		-		-		-	
Model Series COLW		Model Size Selected 20 • 40 • 80 • 100 (Floor Mounted) 20W • 40W (Wall Mounted)		Ports 1 - NPT 2 - SAE 3 - BSPP		Motor 0 - No Motor 3 - 3ph (60 hz NEMA)		Filter Blank - None 3 - 3µ 6 - 6µ 10 - 10µ 25 - 25µ		Indicator Blank - None V - Visual E - Electrical EV - Electrical/ Visual

Wall Mount

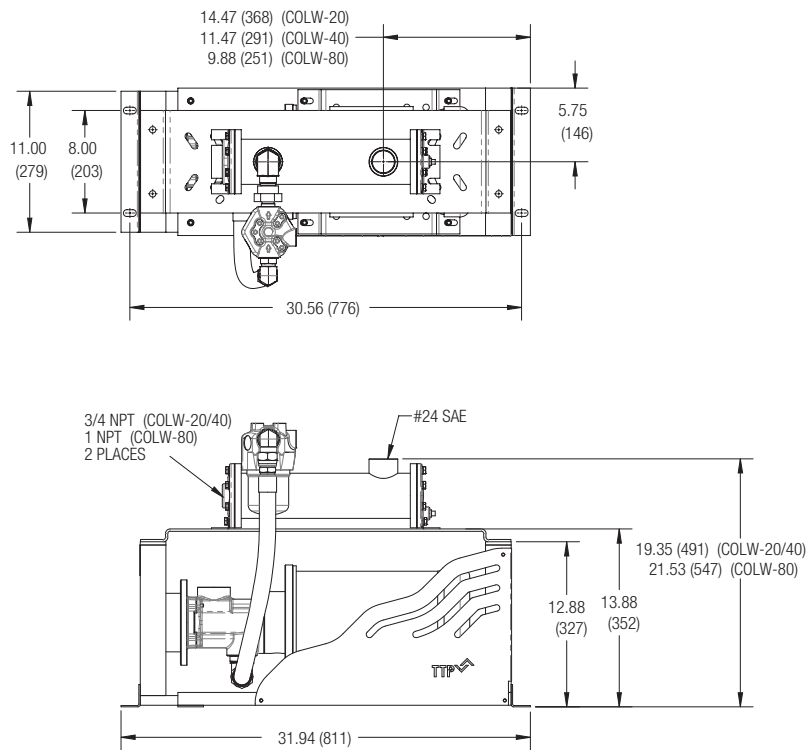


Pump Motor Data

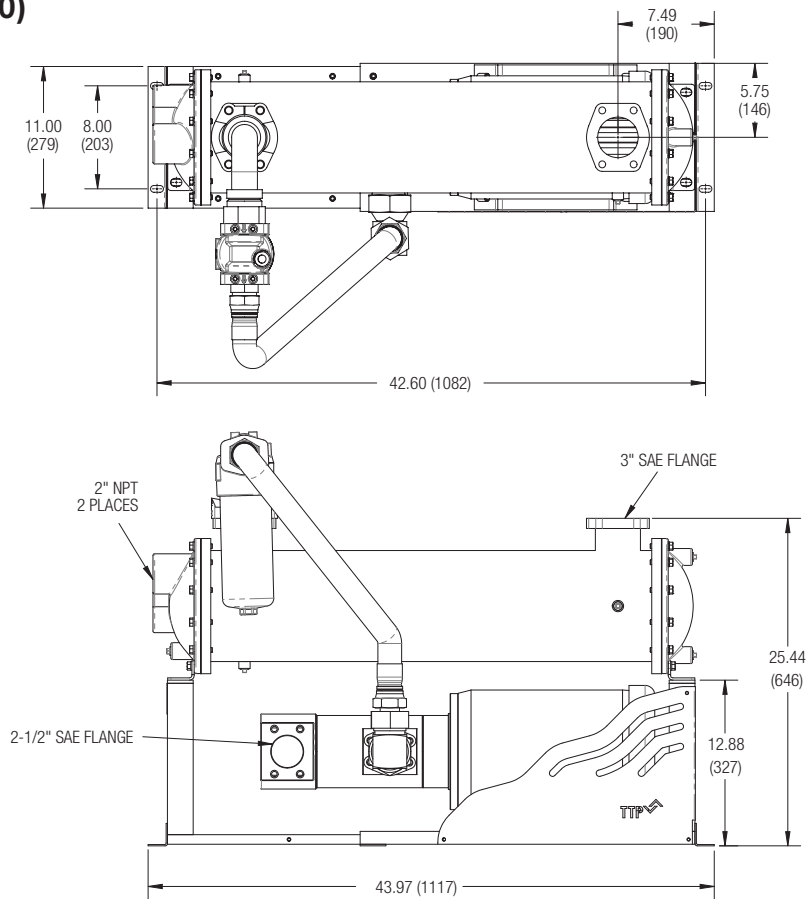
apiheattransfer.com

Dimensions

Floor Mount (COLW-20 – COLW-80)



Floor Mount (COLW-100)



Selection Procedure

STEP 1 Determine Heat Load. Most applications can have a cooler sized for 1/3 of the input HP (KW).

STEP 2 Determine Entering Temperature Difference. (Actual E.T.D.)

E.T.D. = Entering oil temperature °F (°C) – Entering water temperature °F (°C)

The entering oil temperature is generally the maximum desired system oil temperature.

Entering water temperature is the highest water temperature the application will see.

STEP 3 Select Model From Curves. Enter the Performance Curves at the bottom with the GPM (LPM) oil flow and proceed upward to the adjusted Heat Rejection from Step 3. Any Model or Curve on or above this point will meet these conditions.

Listed Performance Curves are based on 46 cSt oil.

If your application conditions are different, consult factory for assistance.

Desired Reservoir Temperature

Oil Temperature: Oil coolers can be selected using entering or leaving oil temperatures.

Off-Line Recirculation Cooling Loop: Desired reservoir temperature is the oil temperature entering the cooler.

Return Line Cooling: Desired reservoir temperature is the oil temperature leaving the cooler. In this case, the oil temperature change must be determined so that the actual oil entering temperature can be found. Calculate the oil temperature change (oil ΔT) with this formula:

$$\text{Oil } \Delta T \text{ } ^\circ\text{F (} ^\circ\text{C)} = (\text{BTU/HR} \div [\text{GPM oil flow} \times 210]) \\ [\text{KW} \div (\text{LPM Oil Flow} \times .029)]$$

To calculate the oil entering temperature to the cooler, use this formula:

$$\text{Oil Entering Temp.} = \text{Oil Leaving Temp.} + \text{Oil } \Delta T.$$

Oil Pressure Drop: Most systems can tolerate a pressure drop through the heat exchanger of 19 to 30 PSI (1.3 to 2.1 BAR). Excessive pressure drop should be avoided. Care should be taken to limit pressure drop to 5 PSI (.35 BAR) or less for case drain applications where high back pressure may damage the pump shaft seals.

Typical operating temperature ranges are:

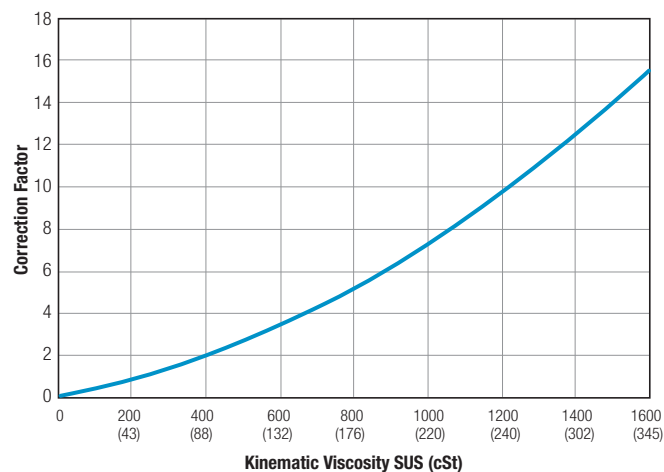
Hydraulic Motor Oil	120 - 180°F (49 - 82°C)
Hydrostatic Drive Oil	160 - 180°F (71 - 82°C)
Engine Lube Oil	180 - 199°F (82 - 93°C)
Automatic Transmission Fluid	199 - 300°F (93 - 149°C)

System Pressure Drop

Model	Oil Flow Rate GPM (LPM)	Dp Less Filter PSI (BAR)	Dp With Filter PSI (BAR)
COLW-20 (60hz)	9.5 (36)	6 (0.4)	13 (0.9)
COLW-40 (60hz)	21 (79)	21 (1.5)	37 (2.6)
COLW-80 (60hz)	35 (133)	20 (1.4)	30 (2.1)
COLW-100 (60hz)	45 (169)	7 (0.5)	17 (1.2)
COLW-20 (50hz)	8 (30)	5 (0.3)	12 (0.8)
COLW-40 (50hz)	16 (61)	15 (1.0)	28 (1.9)
COLW-80 (50hz)	29.5 (112)	16 (1.1)	26 (1.8)
COLW-100 (50hz)	37 (140)	6 (0.4)	16 (1.1)

Total pressure drop is estimate using 46 cSt oil. 10 micron mesh filter is used in calculating the pressure drop. Filter bypass rating is 45 PSI (3.1BAR)

Oil Pressure Drop Correction

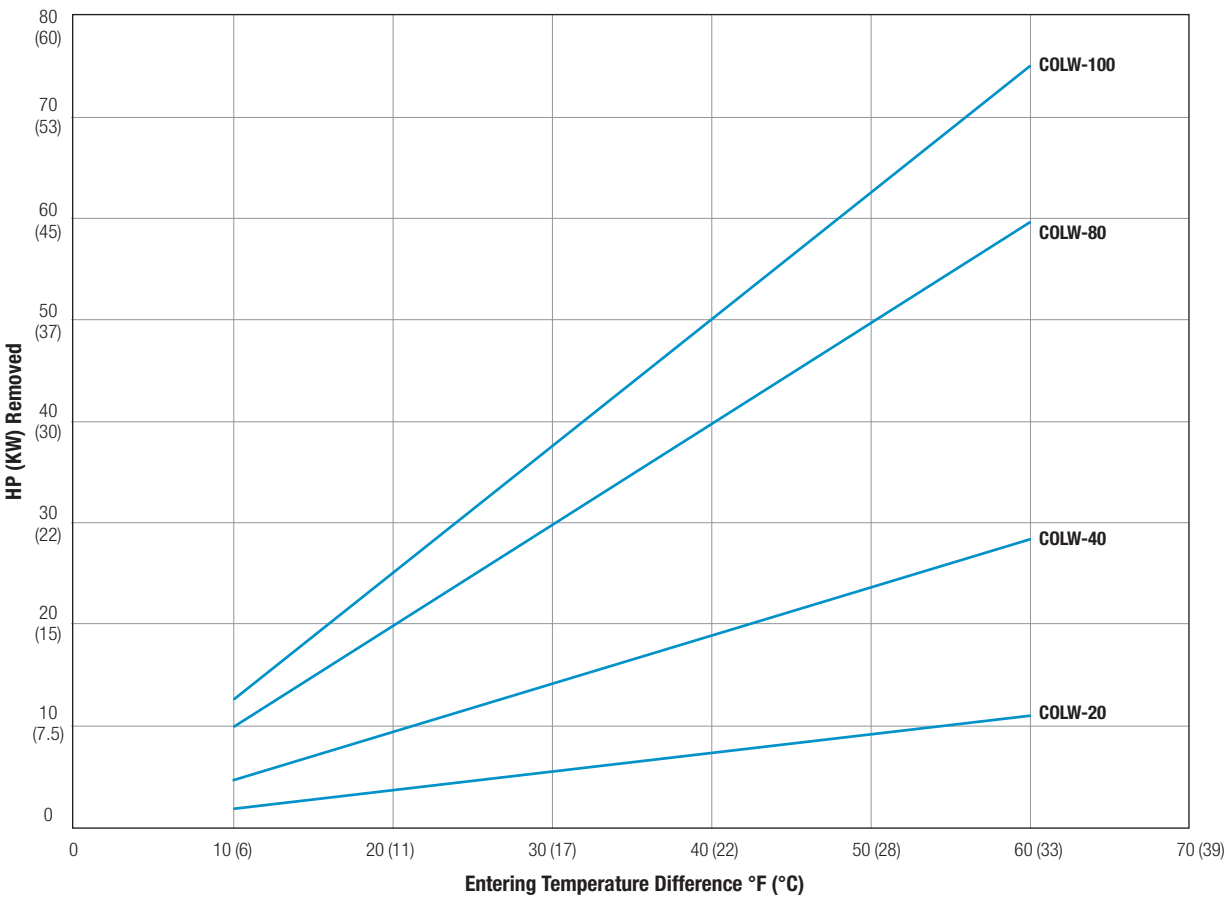


Pump Flow Rates

Model	60 Hz, 1800 RPM Pump Oil Flow Rate GPM (LPM)	50Hz, 1500 RPM Pump Oil Flow Rate GPM (LPM)
COLW-20	9.5 (36)	8 (30)
COLW-40	21 (79)	16 (61)
COLW-80	35 (133)	29.5 (112)
COLW-100	45 (169)	37 (140)

Performance Curves

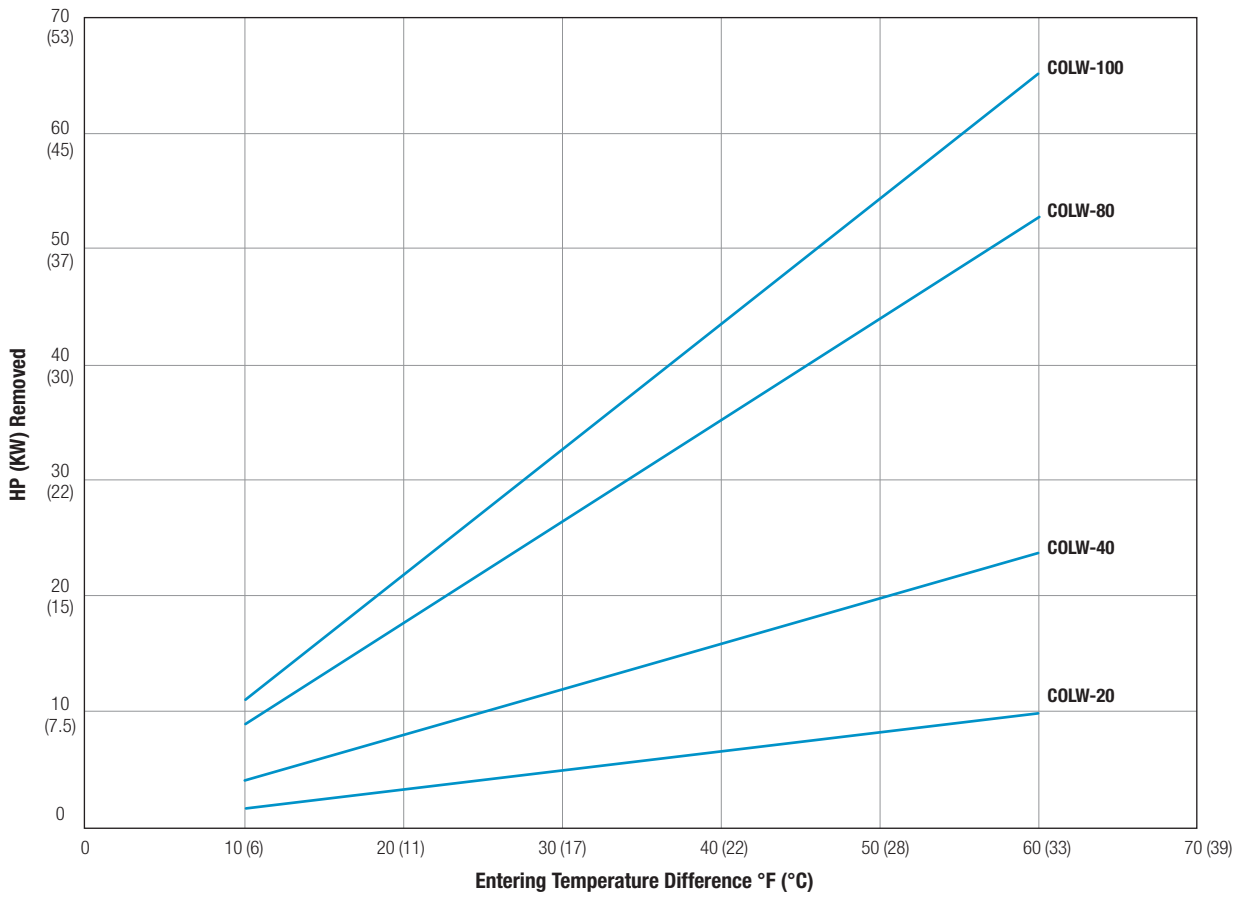
60hz (1800 RPM) Pump 46 cSt Oil



Performance curves are a 2:1 oil to water ratio.

Performance Curves

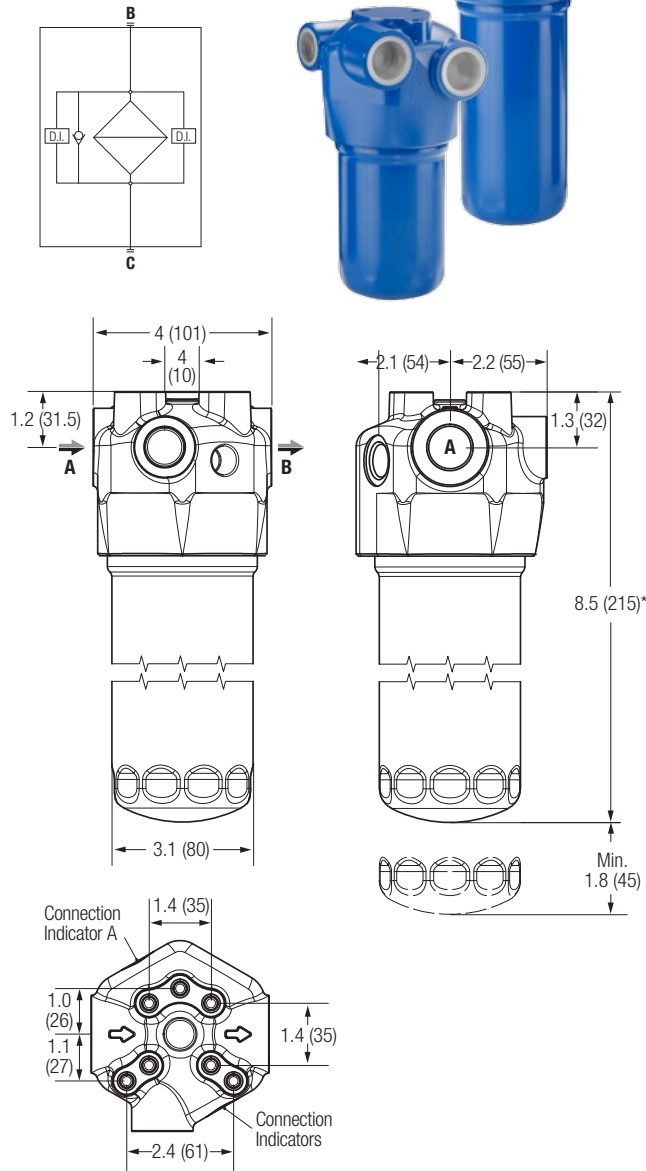
50hz (1500 RPM) Pump 46 cSt Oil



Performance curves are a 2:1 oil to water ratio.

Micron Filter Specifications

COLW-29(W) – COLW-40(W)



*Other bowl lengths available. Consult factory for details.
All dimensions in inches (millimeters), unless noted otherwise.

Filter Housing Materials

- Head – Aluminum
- Housing – Phosphated Steel
- Pressure bypass valve – Brass/Aluminum

Maximum Temperature

- 230°F (110°C)

Pressure Bypass Valve

- Opening pressure – 51 PSI (3.5 BAR) ±10%
- Other opening pressures on request

Connection In/Out

- #12 SAE

Seals

- Standard NBR
- Optional FPM

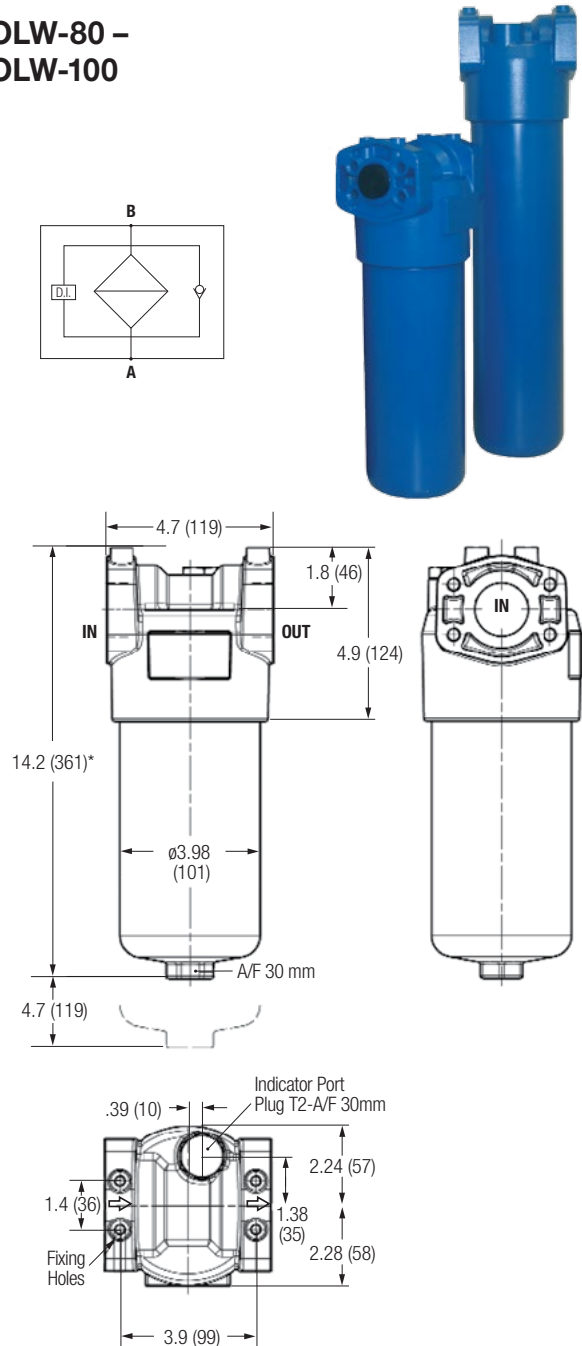
Weight

- 4.0 LBS (1.8 KG)

Volume

- 0.21 gallons (0.81 liters)

COLW-80 – COLW-100



Filter Housing Materials

- Head – Anodized Aluminum
- Housing – Anodized Aluminum
- Pressure bypass valve – Nylon

Maximum Temperature

- 230°F (110°C)

Pressure Bypass Valve

- Opening pressure – 51 PSI (3.5 BAR) ±10%
- Other opening pressures on request

Connection In/Out

- #24 SAE

Seals

- Standard NBR
- Optional FPM

Weight

- 7.7 LBS (3.5 KG)

Volume

- 0.40 gallons (1.5 liters)

Micron Filter Specifications

Filtration Media Composition

- Internal support mesh
- Filter media support
- Filtration media
- Prefilter media
- External support mesh

Compatibility with Fluids

The filter elements are compatible with:

- Mineral oils to ISO 2943-4
- Aqueous emulsions
- Synthetic fluids, water glycol

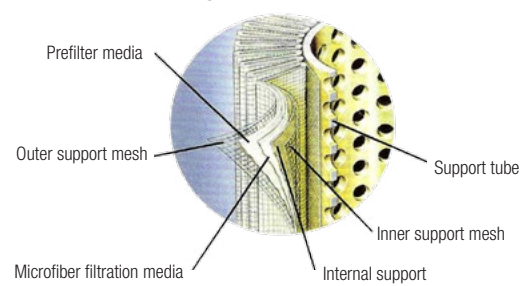
Seals, standard in NBR compatible with:

- Mineral oils to ISO 2943-4
- Aqueous emulsions
- Synthetic fluids, water glycol

FPM seals compatible with:

- Synthetic fluids type HS-HFDR-HFDS-HFDU to ISO 6743-4

Inorganic Microfiber



Multipass Test

In compliance with new ISO 16889 Standard

Contaminant ISO MTD

Value B	2	10	75	100	200	1000*
Filtration efficiency	50%	90%	98.70%	99%	99.50%	99.90%

*TTP Standard

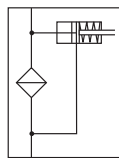
International Standards for Fluid Contamination Control

Components	Recommended Filtration								
Servo valves			●	●	●				
Proportional valves				●	●	●			
Variable displacement pumps					●	●	●		
Cartridge valves						●	●	●	
Piston pumps						●	●	●	
Vane pumps							●	●	●
Pressure/flow rate control valves							●	●	●
Solenoid valves							●	●	●
ISO code	12/10/7	13/11/8	14/12/9	15/13/10	16/14/11	17/15/12	18/16/13	19/17/14	20/18/15
NAS code	1	2	3	4	5	6	7	8	9
Absolute filtration recommended	3 micron				6 micron		10 micron*		>10 micron

*TTP Standard

Filtration Indicators

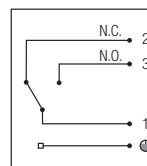
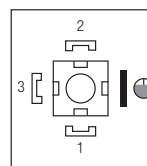
Visual "V"



- Cover and lens: nylon
- Visual indicator green: cartridge clean
- Visual indicator red: cartridge clogged
- Weight: 4.8 oz (136 g)
- Tightening torque: 70 FT-LBS (95 Nm)

Electrical/Visual "EV"

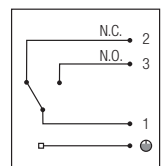
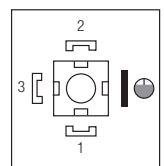
Connector EN 175301-803 A/ISO4400



- Protection rating: IP 65
- Maximum contact rating: 5 A/250V~
- Voltage: 230 V~
- Connector: DIN 43650 Microswitch contact
- Cable gland: PG 9
- Cover and lens: nylon
- Visual indicator green: cartridge clean
- Visual indicator red: cartridge clogged
- Weight: 6.6 oz (187 g)
- Tightening torque: 70 FT-LBS (95 Nm)

Electric "E"

Connector EN 175301-803 A/ISO4400



- Protection rating: IP 65
- Maximum contact rating: 5 A/250V~
- Voltage: 230 V~
- Connector: DIN 43650 Microswitch contact
- Cable gland: PG 9
- Weight: 6.5 oz (184 g)
- Tightening torque: 48 FT-LBS (65 Nm)