

Product Data Sheet Metco MC Chillers

Metco™ MC Chillers are specifically designed for use with atmospheric plasma and HVOF thermal spray processes. Through the use of energy-conscious components, MC Chillers are highly efficient and built for long-lasting, reliable service.

The Metco MC Chillers have an "A" energy efficiency rating. They incorporate the latest rotary screw compressors, resulting in substantially better performance than conventional chillers. Metco MC Chillers perform at 100% capacity at ambient temperatures up to +45 °C (+113 °F).

Metco MC Chillers utilize a capacity regulator that reduces energy consumption during low-load and standby conditions. It sequentially cuts off power to the compressors and then adjusts cylinder capacities to reduce energy consumption while maintaining a stable water temperature. It also increases the overall service life of the chiller for many years of trouble-free operation. Metco MC Chillers also incorporate frequency controllers that regulate pump activity appropriate to the requirements of the coating process.

When integrated into an Oerlikon Metco MultiCoat™ system platform, all chiller functions can be controlled from the operator console via a digital interface. The chillers can also be operated in standalone mode.

Metco MC Chillers achieve excellent reliability and cooling capacities through the use of high-capacity heat exchangers and additional sub-cooling within the condenser. The higher capacity chillers employ a multi-compressor design to reduce energy consumption. Deionization is integrated into the chiller and PLC controlled which results in longer spray times and gun component life.

Standard and DUAL units are available. DUAL units can be used to cool two different thermal spray circuits, such as HVOF and atmospheric plasma spray. The advantage is that the two cooling loops are specifically designed to meet the requirements of the individual spray processes.

All Metco MC Chillers are CE conformant.



Metco MC15



Metco MC40



Metco MC90 DUAL

1.1 Models

Model ^a	Cooling Capacity	No. of Cooling Circuits	APS	HVOF-GF	HVOF-LF
MC15	15 kW (51 200 Btu/h)	1 refrigeration + 1 water	✓ ^b	✓	✗
MC40	40 kW (136 500 Btu/h)	1 refrigeration + 1 water	✓	✗	✗
MC40 DUAL	40 kW (136 500 Btu/h)	1 refrigeration + 2 water	✓	✓	✗
MC90	90 kW (307 000 Btu/h)	1 refrigeration + 1 water	✓ ^{b, c}	✗	✓
MC90 DUAL	90 kW (307 000 Btu/h)	1 refrigeration + 2 water	✓	✓ ^d	✓

APS = Atmospheric Plasma Spray; **HVOF-GF** = gas-fuel HVOF; **HVOF-LF** = liquid fuel HVOF

^a Standard units cool one thermal spray circuit; DUAL units cool two thermal spray circuits, one at a time

^b Requires deionization kit, order no. 1095041

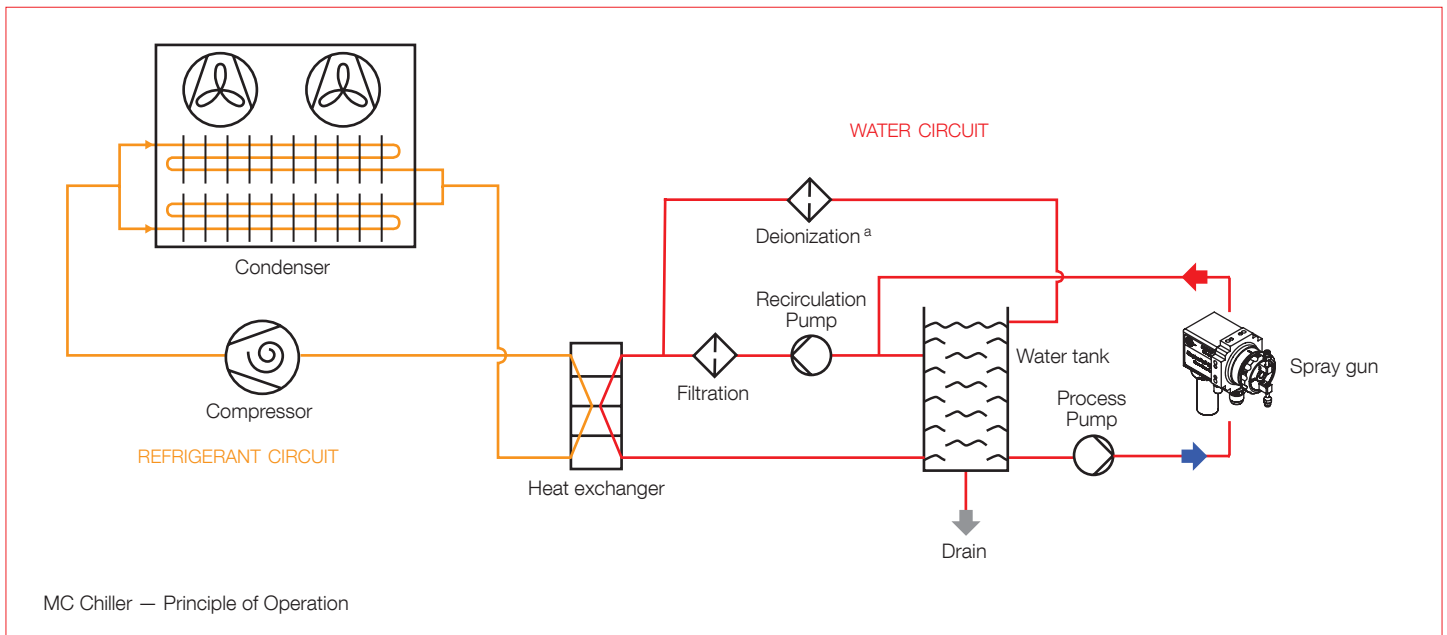
^c Recommended for high-power APS spray guns, such as TriplexPro, Metco 8MB and I-Pro series spray guns

^d Select when using both a high-power APS spray gun and HVOF-GF

1.2 Standard MC Chillers

Metco MC Chillers are very compact units compared to previous Metco chiller offerings. They reduce the required floor space by up to 50%. These chillers are specifically designed to cool thermal spray guns. The Metco MC Chillers consist of an air-to-refrigerant chiller and a refrigerant-to-water heat exchanger. They provide cooling water to a single thermal spray circuit. Refer to the table in section 1.1 for cooling capacities and thermal spray process compatibility.

A state-of-the-art, hermetically sealed compressor is used to cool environmentally-friendly R-410A refrigerant. The refrigerant is then used to cool the process water at the heat exchanger. In-line deoxygenation and deionization filters condition the water, which increases gun component life. A large water conditioning tank supplies the chilled water to the thermal spray gun by means of a frequency-controlled pump.



^a Optionally available with the Metco MC15 or Metco MC90 chillers

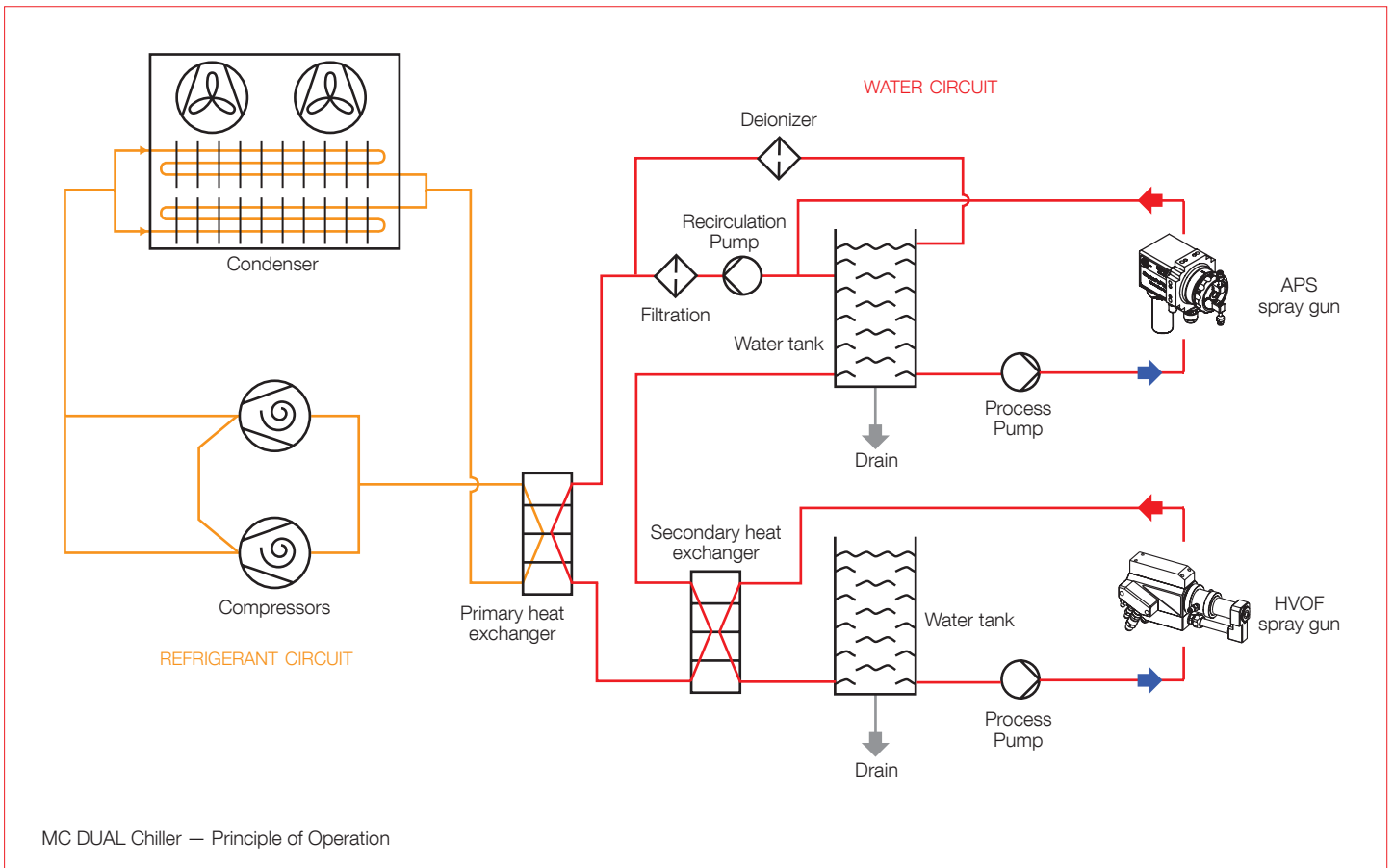
1.3 MC DUAL Chillers

The Metco MC DUAL Chillers are very compact units compared to previous Metco chiller offerings. They reduce the required floor space by up to 50%. They are designed specifically to cool thermal spray guns. Metco MC DUAL Chillers consist of an air-to-refrigerant chiller, a refrigerant-to-water heat exchanger, and two separate water-to-water heat exchangers. They provide cooling water for two thermal spray circuits. The separated circuit design isolates the two thermal spray circuits, thereby preventing cross-contamination of the deionized water within the APS circuit.

The two thermal spray circuits are operated in series. Metco MC DUAL Chillers are optimized to handle multiple combinations of thermal spray processes. Please refer to the table in section 1.1 for processes and combinations.

Two state-of-the-art, hermetically sealed compressors are used to cool the R-410A refrigerant. The refrigerant is then used to cool the water from the primary thermal spray circuit at the heat exchanger. This chilled water is then used to cool the water from the secondary thermal spray circuit at the second water-to-water heat exchanger.

Experience has shown that the Metco MC DUAL solution results in longer service life of thermal spray gun consumable parts and better coating quality through the use of the two large water conditioning tanks that supply the chilled water to the thermal spray circuit by means of two independent frequency-controlled pumps. In addition, in-line deoxygenation and deionization filters condition the water to further increase gun life.



2 Features and Benefits

Effective

- Designed specifically for the cooling requirements of thermal spray processes

Efficient

- Closed-loop PLC control ensures excellent repeatability of process parameters
- On-board water conditioning and filtering ensures extended gun component life
- Highly efficient chiller and heat exchanger combination eliminates multiple interconnections, thereby reducing system complexity
- All chiller functions are controlled, set and monitored at chiller user interface or through the MultiCoat system platform for simple operation and spray parameter setup
- Multi-level alarm system for safety with diagnostic and operational alarms and warnings

Economical

- Metco MC Chillers offer a low-cost yet highly effective solution for cooling thermal spray circuits
- Energy conscious design results in dramatically reduced operation costs
- Frequency-controlled pumps for ease of operation and tremendous energy savings
- Simple, robust construction combined with premium quality components requires little maintenance and provides years of trouble-free service
- Spare parts and service support are readily available worldwide

Environmental

- Extremely compact footprint minimizes shop floor requirements
- Uses eco-friendly refrigerants
- Designed for indoor or optionally for outdoor installation

3 Options and Accessories

Conductivity Sensor

Description	Order No.
Conductivity sensor ^a	1095043

Water treatment cartridges

Description	Order No.
Demineralization Cartridge	1095041
Filter Cartridge RB50-BB	1076948

^a Not required for MultiCoat systems as sensor is built into the JAM Box

Water Supply Hoses

Description	Order No.
Chiller Hose Set DN19 [ID 19 mm (3/4 in)], 30 m (98 ft)	1099830
Chiller Hose Set DN25 [ID 25 mm (1 in)], 60 m (197 ft)	1099831

Outdoor Kit: Stainless steel construction that prevents corrosion of the chiller when installed outdoors.

Winter Kit: Consists of an automatic control mechanism that initiates water circulation throughout the cooling circuit when the water temperature falls below a predetermined set point. This installation enables the chiller to operate effectively and instantly even at temperatures as low as -10 °C (+14 °F).

Summer Kit (Includes the Outdoor Kit): Designed for operation in regions with very high ambient temperatures. Suitable for operation at temperatures up to +55 °C (+131 °F).

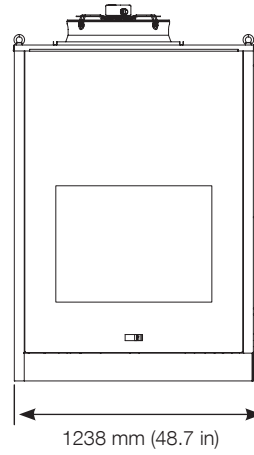
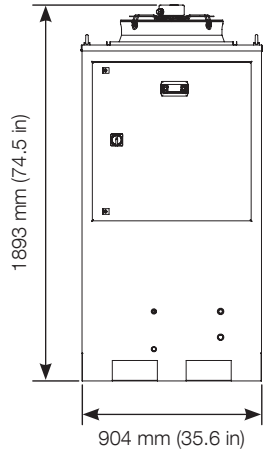
Remote Interface: Interfaces with the MultiCoat onboard gun database to automatically set the chiller parameters for the specific spray gun used rather than having to set the chiller parameters manually at the chiller. This ensures optimal cooling parameters for the spray gun and improves gun component life.

High Pressure Stainless Steel Pump: Replaces the standard pump to increase water flow rates up to 30 l/min (8 gal/min) and pressures up to 25 bar (363 psi). This option is particularly suitable for HVOF processes that require higher flow rates and pressures.

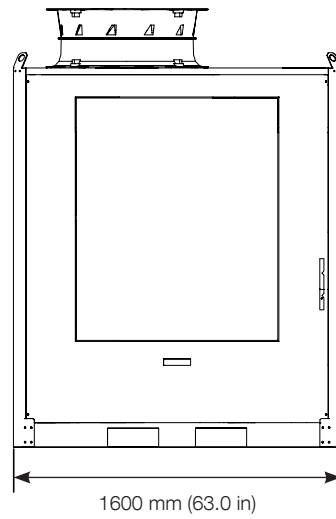
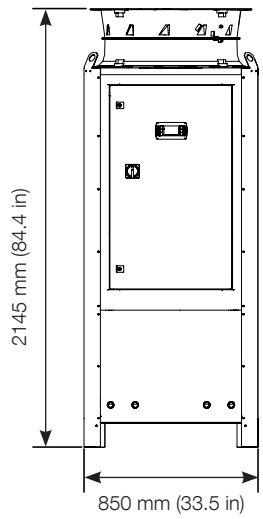
4 Technical Data

4.1 Dimensions

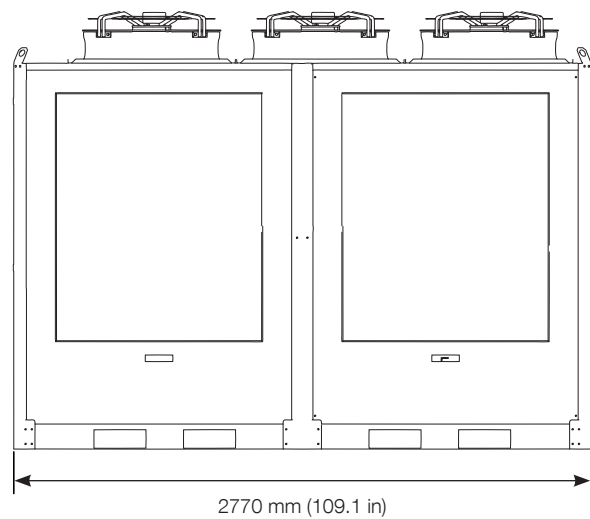
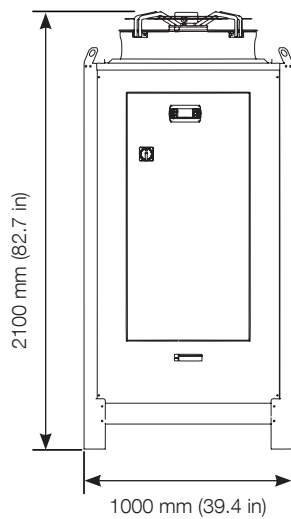
MC15



MC40



MC90



4.2 Specifications

		MC15	MC40 / MC40 Dual	MC90 / MC90 Dual
Weight				
Weight without water	approx.	500 kg (1102 lb)	530 kg (1168 lb)	1425 kg (3142 lb)
Process Media				
Coolant		R410A	R410A	R410A
Medium		Water	Water	Water
Performance				
Cooling capacity	max	15 kW (51 200 Btu/h)	40 kW (136 500 Btu/h)	90 kW (307 000 Btu/h)
Temperature offset		18 °C (32 °F)	16 to 20 °C (29 to 36 °F)	16 to 20 °C (29 to 36 °F)
Ambient temperature	max	+45 °C (+113 °F)	+45 °C (+113 °F)	+45 °C (+113 °F)
	min	+10 °C (+50 °F)	+10 °C (+50 °F)	+10 °C (+50 °F)
Water flow rate		30 l/min (8 gal/min)	30 l/min (8 gal/min)	30 l/min (8 gal/min)
Air flow rate		8000 m ³ /h (4710 ft ³ /min)	10 200 m ³ /h (6000 ft ³ /min)	35 400 m ³ /h (20 300 ft ³ /min)
Outlet pressure	max	16 bar (232 psi)	21.2 bar (307 psi)	21.2 bar (307 psi)
Tank capacity	HVOF circuit	140 l (37 gal)	85 l (22.5 gal) ^a	85 l (22.5 gal) ^a
	APS circuit	---	165 l (43.6 gal)	365 l (96.4 gal)
Power				
Power consumption	nominal	11 kVA	18 kVA	38.3 kVA
Current		28.8 A	32.3 A	72.1 A
Voltage		400 V / 460 V	400 V / 460 V	400 V / 460 V
Frequency		50 Hz / 60 Hz	50 Hz / 60 Hz	50 Hz / 60 Hz
Connections				
Pipe connections, inlet and outlet		1.25 in	1.25 in	1.25 in
Drain connection		0.5 in	0.5 in	0.5 in
Display^b				
	at chiller			
Language	switchable	English, German	English, German	English, German
Units	switchable	metric, US customary	metric, US customary	metric, US customary

^a DUAL units

^b When using a MultiCoat system platform, values can be controlled and read at the operator console in the language and units set at the controller.