



MTA – F SERIES

**Oil Free Centrifugal
Air Cooled Chiller**



Nominal Cooling Capacity 281 to 1406 kW (R)
Refrigerant: R134a



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FEATURES

Cutting-edge Compressor Technology

MTA series chiller uses oil-free magnetic levitation centrifugal compressors which represent the cutting edge compressor technology of the 21st Century. Conventional mechanical bearings are replaced by highly sophisticated magnetic bearings with top aerospace technology. The motor, drives shaft and centrifugal impellers all levitate in the magnetic field without any immediate contacts. Mechanical frictions, efficiency loss, vibration and noise are eliminated. The compressor is free from oil pump, oil supply system and at the same time avoids efficiency loss caused by oil use in heat exchanger.

High Efficiency Flooded evaporator

Evaporator is shell and tube construction. It is constructed of a single shell, flooded type with refrigerant surrounding the tubes and water passing through the tubes. Tubes are enhanced with internal threads and external fins. Internal intermediate tube supports, liquid eliminator baffle plate, pressure relief vent, water drains and vents are required. The evaporator has high efficiency of heat exchange and maintains stable operation for convenient maintenance.

Electronic Expansion Valve

Electronic expansion valve (EXV) is used as the throttling devices for evaporator and economizer. EXV has accurate flow regulating performance and work with intelligent control system to achieve maximum reliability.

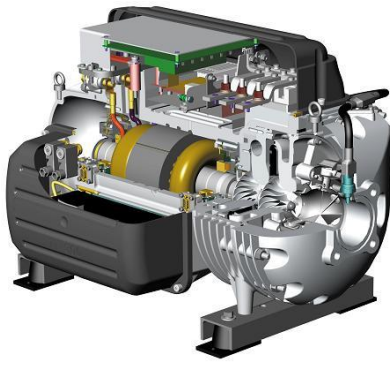
Rifled “V” Configuration Condenser

Condenser is constructed of fin boned rifled copper tubes to increase heat exchange surface and disturbance in the flowing of refrigerant, and improve heat exchange rate; flat “V” configuration enhances the efficiency of heat transfer.

Low-Sound Fan (Optional)

Air Cooled condenser is equipped with high efficiency EC Fans constructed with DC variable frequency permanent magnet motor in external drive and incorporate integrated controller to modulate fan speed. Fan blades are of aluminum construction with innovative bionic-blade. Fans are designed for noise-optimized operation and energy performance.

Cutting Edge Performance



- Near water-cooled efficiencies at air cooled conditions with unprecedented part-load performance
- Magnetic levitation technology offers a near-frictionless two-stage variable speed centrifugal compressor for maximum efficiency at all load conditions
- Oil free design eliminates performance degradation and ensures sustainable, documentable performance over the life of the chiller as well as reduced maintenance
- Flooded 2-pass evaporator provides low-flow turndown at extreme efficiency levels

MS One Controls

- Real time chiller optimization with Natural Progression Control
- Robust industrial grade computing hardware
- Standard chilled-water pump control



EC Blue Axial Fan

- Direct Driven axial fan
- Aerodynamic-optimized, sickle-blade profile, patterned with serrated trailing edge and winglets on the blade outer edge for energy and noise optimized operation
- Highly efficient external rotor motor with innovative bionic-blade
- Drive motor in external rotor principle, sealed in protection class IP54
- The motor efficiency class complies with IE4
- Maintenance free ball bearings sealed on both sides with long term lubrication

MODEL NUMBER DESIGNATION

MT	A	080	F	C	A	E	S
1	2	3	4	5	6	7	8

1. Multistack Turbocor compressor

2. Cooling type:

A: Air cooled

W: Water cooled

3. Model Number

4. Flooded Evaporator

5. Type of Chiller:

C: Cooling Only

R: Heat Recovery

6. Electrical Specifications

A: AC400V \pm 10% / 50Hz / 3Ph

B: AC380V / 60Hz / 3Ph

C: AC440-460V / 60Hz / 3Ph

7. Refrigerant

E: R134a

8. Fan Configuration:

S: Standard

H: High Static*

L: Low Sound*

*price to be advised on request

TECHNICAL DATA

Per Module

Model No.		080	090	100	120	125	160
Nominal Cooling Capacity (kW)		281	317	352	422	440	563
Power Input (kW)		79.5	86.2	95.1	115.5	114.8	159.4
COP (w/w)		3.53	3.68	3.70	3.65	3.83	3.53
IPLV (w/w)		6.28	6.65	6.39	6.57	6.71	6.39
Control System		MS One Controller					
Compressor	Type	Magnetic Levitation Oil Free Centrifugal					
	Number	1	1	1	1	1	2
	Control Stages (%)	40-100	30-100	40-100	30-100	30-100	20-100
FLA (A)		135	135	210	210	210	135
Evaporator	Type	Flooded Shell & Tube					
	CH.W. Flow (m³/h)	48.3	54.5	60.5	72.6	75.7	96.8
	Water Pressure Drop (kPa)	54.8	45.6	55.1	76.6	73.1	54.9
	Fouling Factor (m²k/kW)	0.018					
	Max. Working Pressure (kPa) (Water Side)	1000					
	Passes	2					
	Water Connection Size	4"	5"				
Condenser	Type	Air Cooled Fin Tube Heat Exchanger					
	Number of fan	4	6	6	8	10	8
	Power per Fan (kW)	1.715					
	RLA per fan (A)	2.65					
Refrigerant		R134a					
Refrigerant charge (kg)		135	165	181	220	250	270
Dimension	L (mm)	2600	3900	3900	5200	6500	5200
	W (mm)	2200					
	H (mm)	2500					
	H (without fan) (mm)	2200					
Shipping weight (kg)		2500	2800	2900	3500	4700	5000
Operation weight (kg)		2600	2900	3000	3600	4800	5200

F.L.A. = Full Load Amperage

Nominal Values based on:

- Ambient Temp. 35°C
- Chilled Water Entering Temp. 12°C
- Chilled Water Leaving Temp. 7°C

To be continued...

TECHNICAL DATA (cont'd)

Per Module

Model No.		180	190	200	240	300	350	400
Nominal Cooling Capacity (kW)		633	668	703	844	1055	1231	1406
Power Input (kW)		177.1	185.0	185.9	224.3	278.5	337.2	371.8
COP (w/w)		3.57	3.61	3.78	3.76	3.79	3.65	3.78
IPLV (w/w)		6.72	6.52	6.68	6.77	6.84	6.77	6.68
Control System		MS One Controller						
Compressor	Type	Magnetic Levitation Oil Free Centrifugal						
	Number of compressors	2	2	2	2	3	4	4
	Control Stages (%)	15-100	20-100	20-100	15-100	15-100	10-100	10-100
FLA (A)		135	210	210	210	210	135	210
Evaporator	Type	Flooded Shell & Tube						
	CH.W. Flow (m³/h)	108.9	114.9	120.9	145.1	181.4	211.6	241.8
	Water Pressure Drop (kPa)	59.5	65.6	71.9	77.3	74.3	56.5	71.9
	Fouling Factor (m²k/kW)	0.018						
	Max. Working Pressure (kPa) (Water Side)	1000						
	Passes	2						
	Water Connection Size	6"				8"	6" x 2	
Condenser	Type	Air Cooled Fin Tube Heat Exchanger						
	Number of fan	10	10	12	16	18	20	24
	Power per Fan (kW)	1.715						
	RLA per fan (A)	2.65						
Refrigerant		R134a						
Refrigerant charge (kg)		310	330	380	490	560	620	760
Dimension	L (mm)	6500	6500	7800	10400	11700	13000	15600
	W (mm)	2200						
	H (mm)	2500						
	H (without fan) (mm)	2200						
Shipping weight (kg)		5000	5500	6400	7800	9300	10000	12800
Operation weight (kg)		5100	5600	6500	8000	9500	10200	13000

F.L.A. = Full Load Amperage

Nominal Values based on:

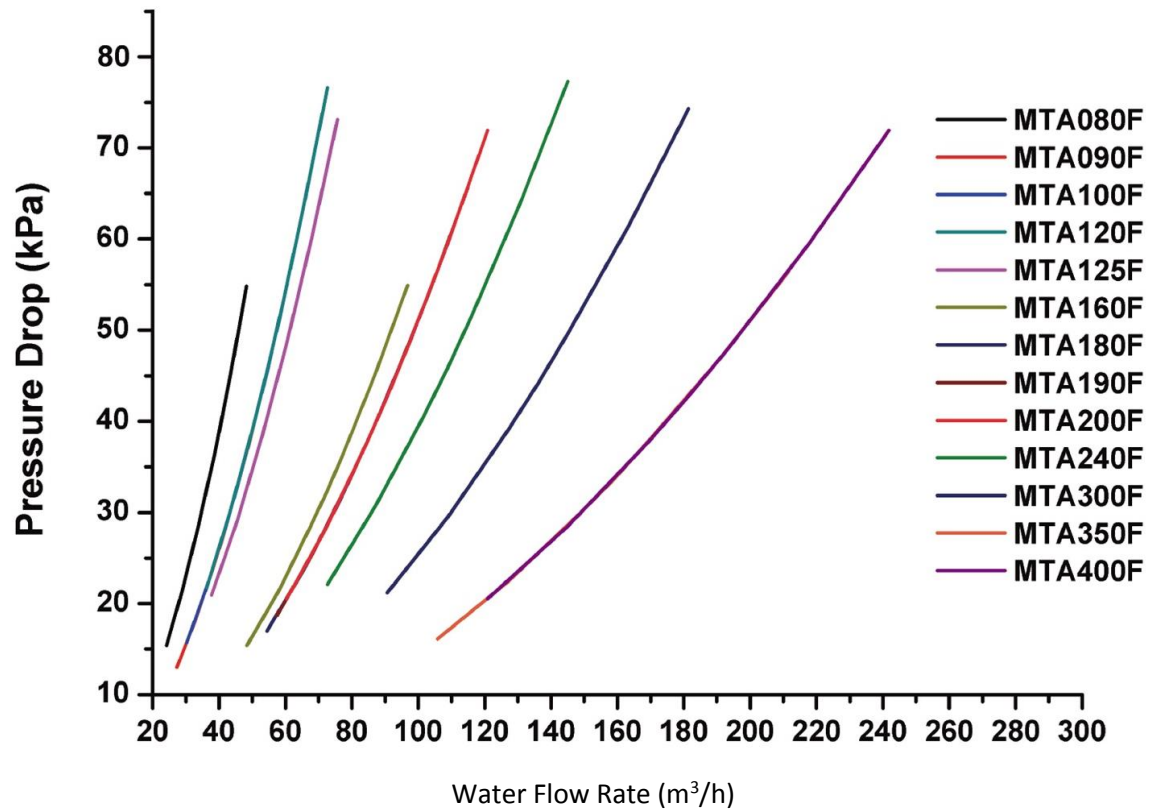
- Ambient Temp. 35°C
- Chilled Water Entering Temp. 12°C
- Chilled Water Leaving Temp. 7°C

Notes:

MTA350 & MTA400 are constructed by two individual systems with two separate CH.W. outlets

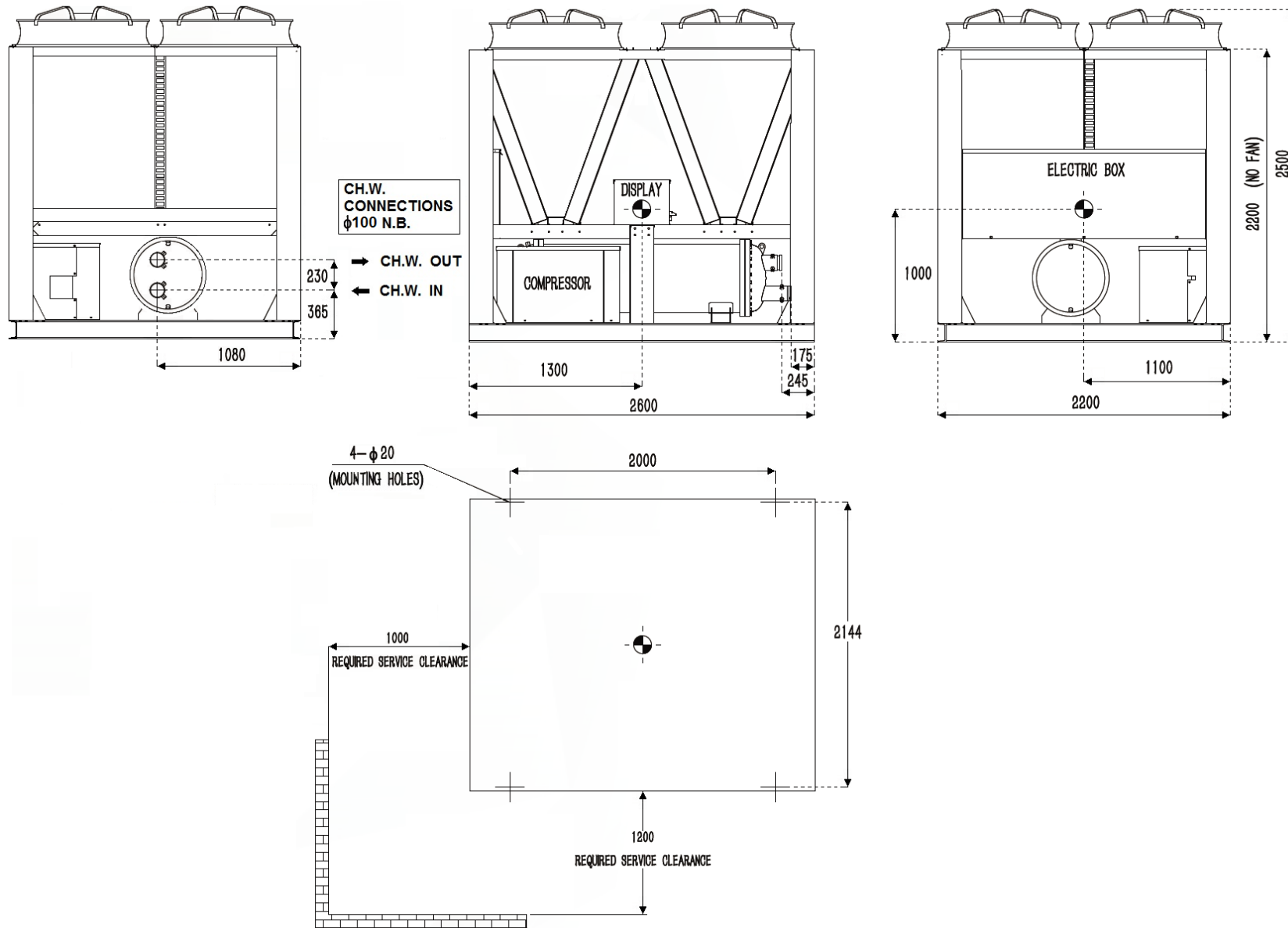
PRESSURE DROP CHART

50% to 100% Load CH.W. Flow Rate vs Corresponding Pressure Drop

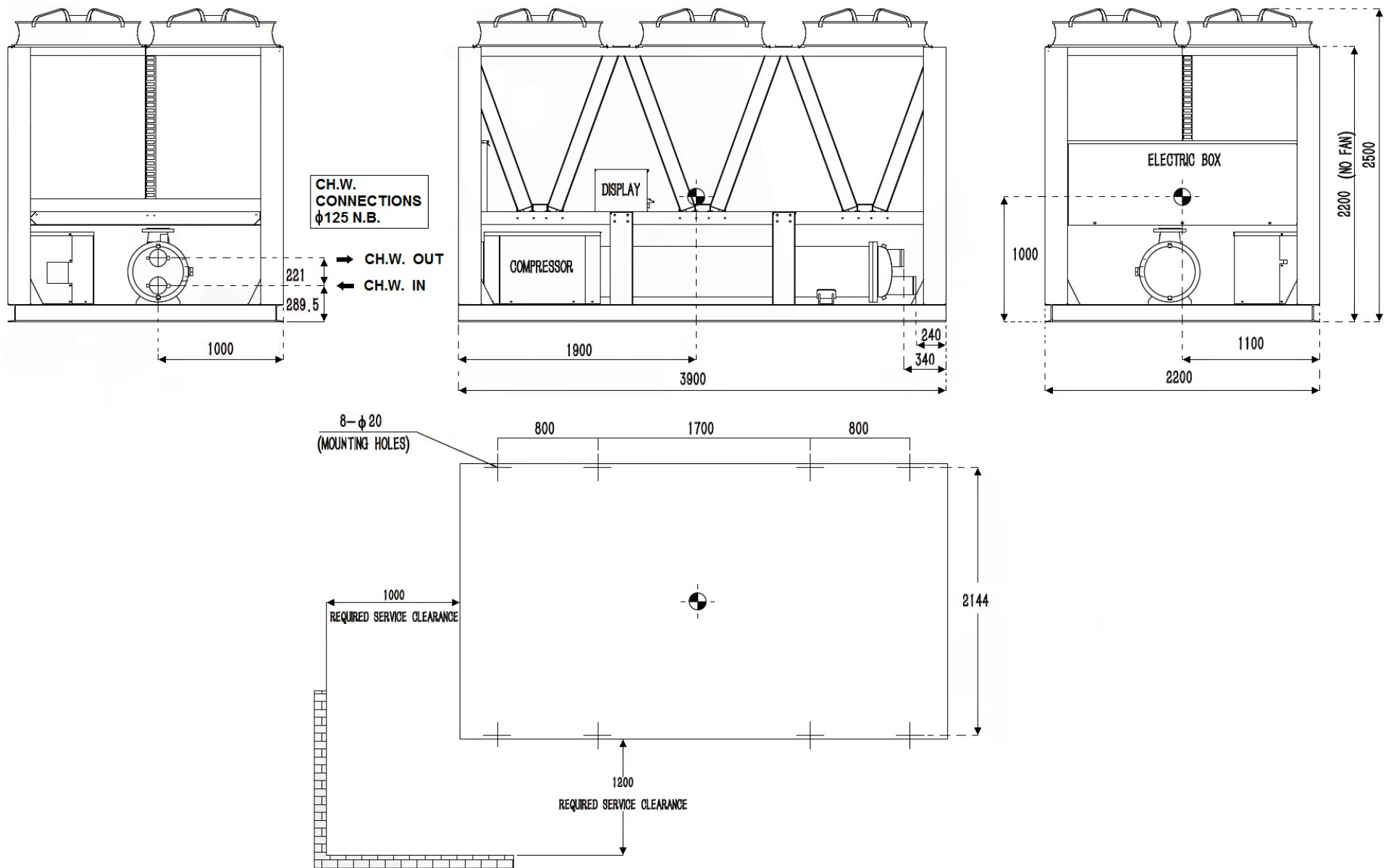


PHYSICAL DIMENSIONS

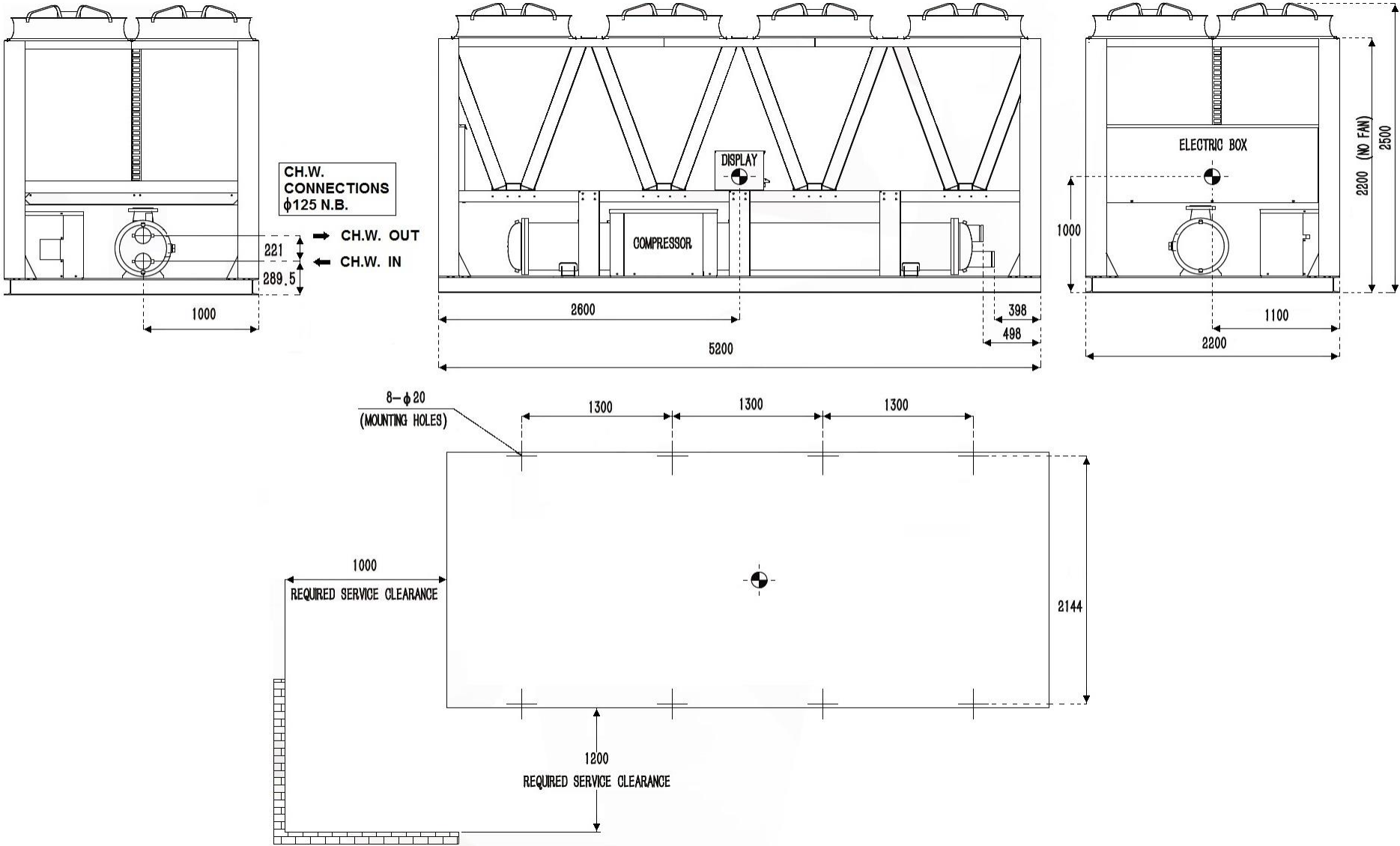
MTA080



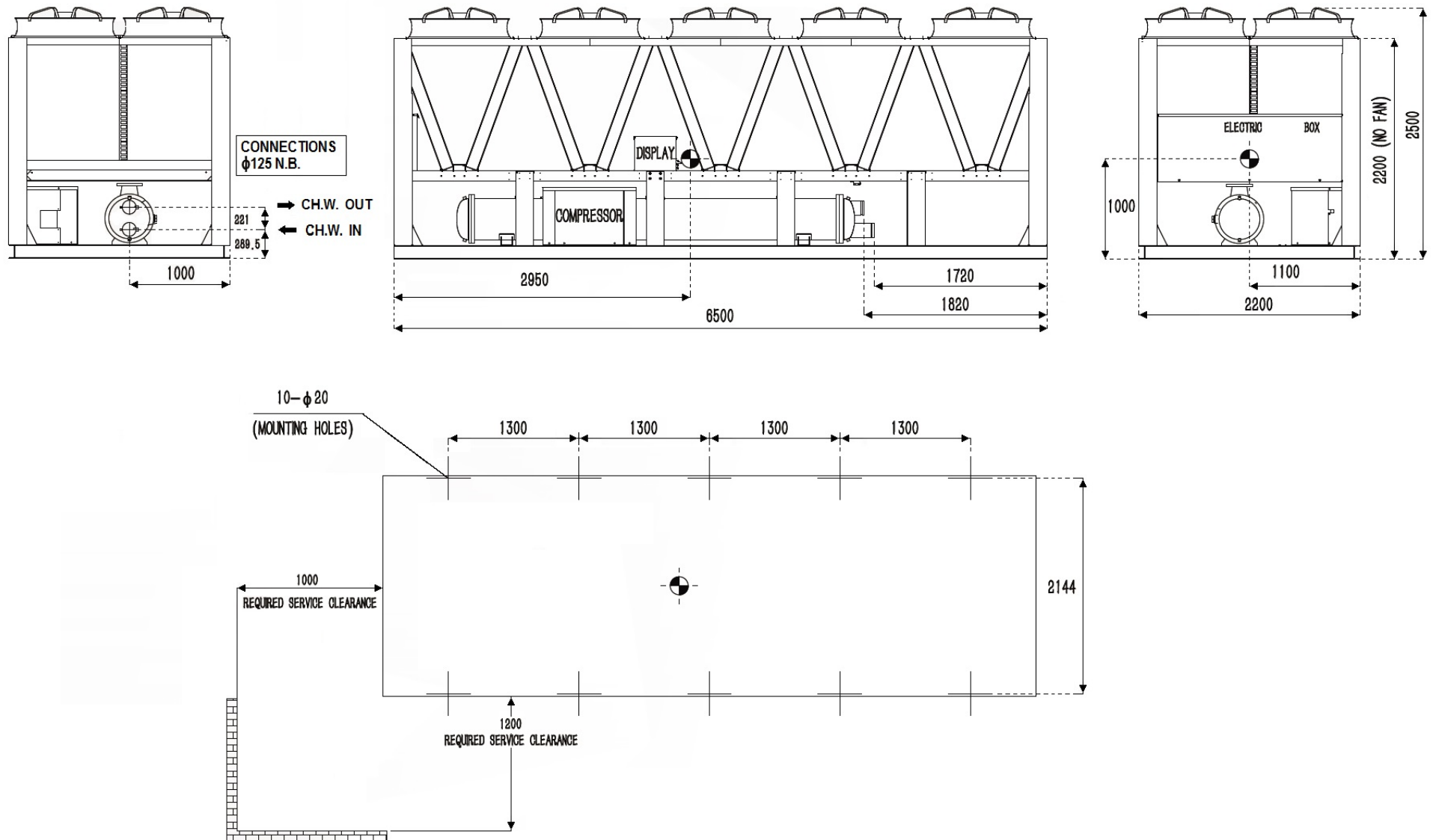
MTA090 / 100



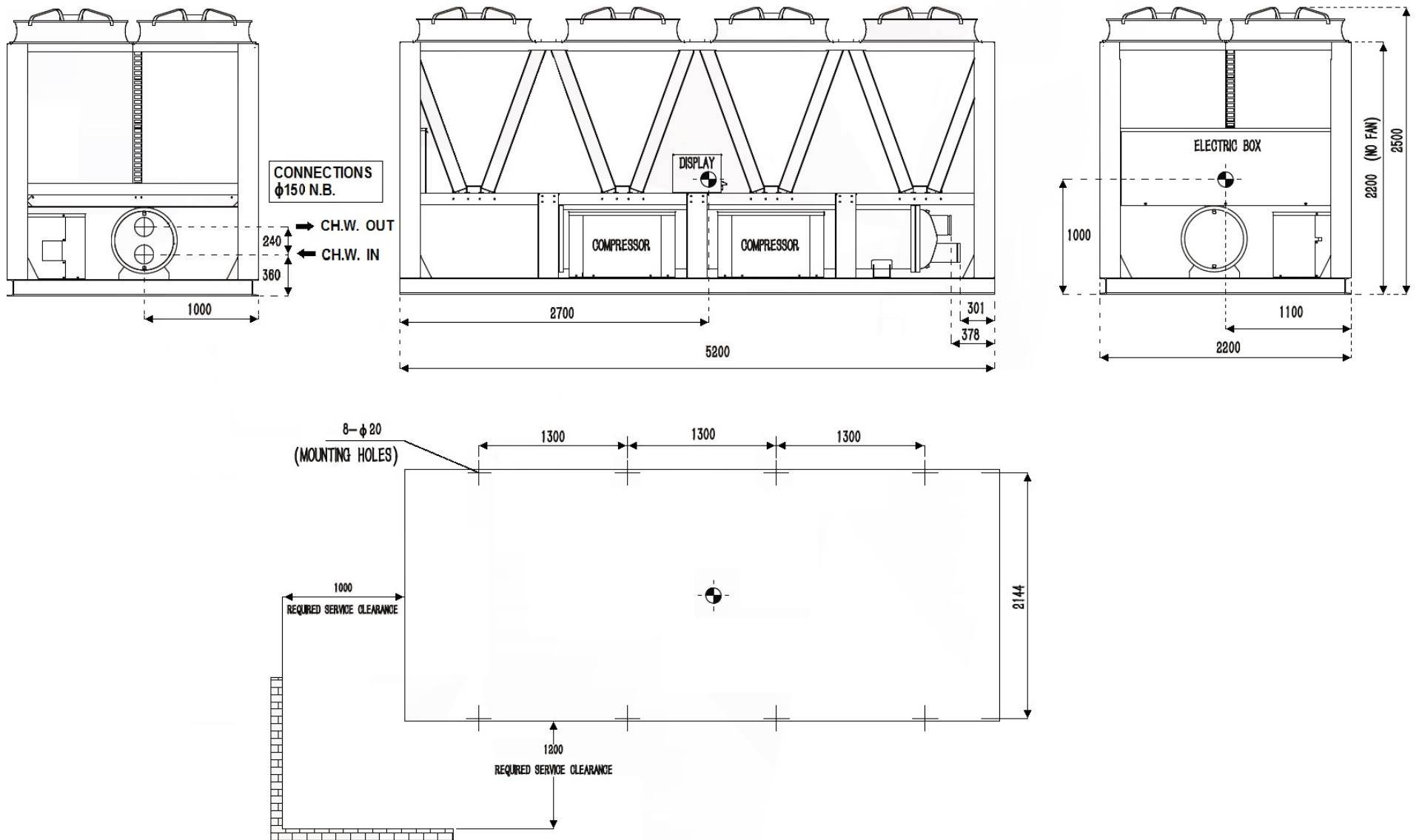
MTA120



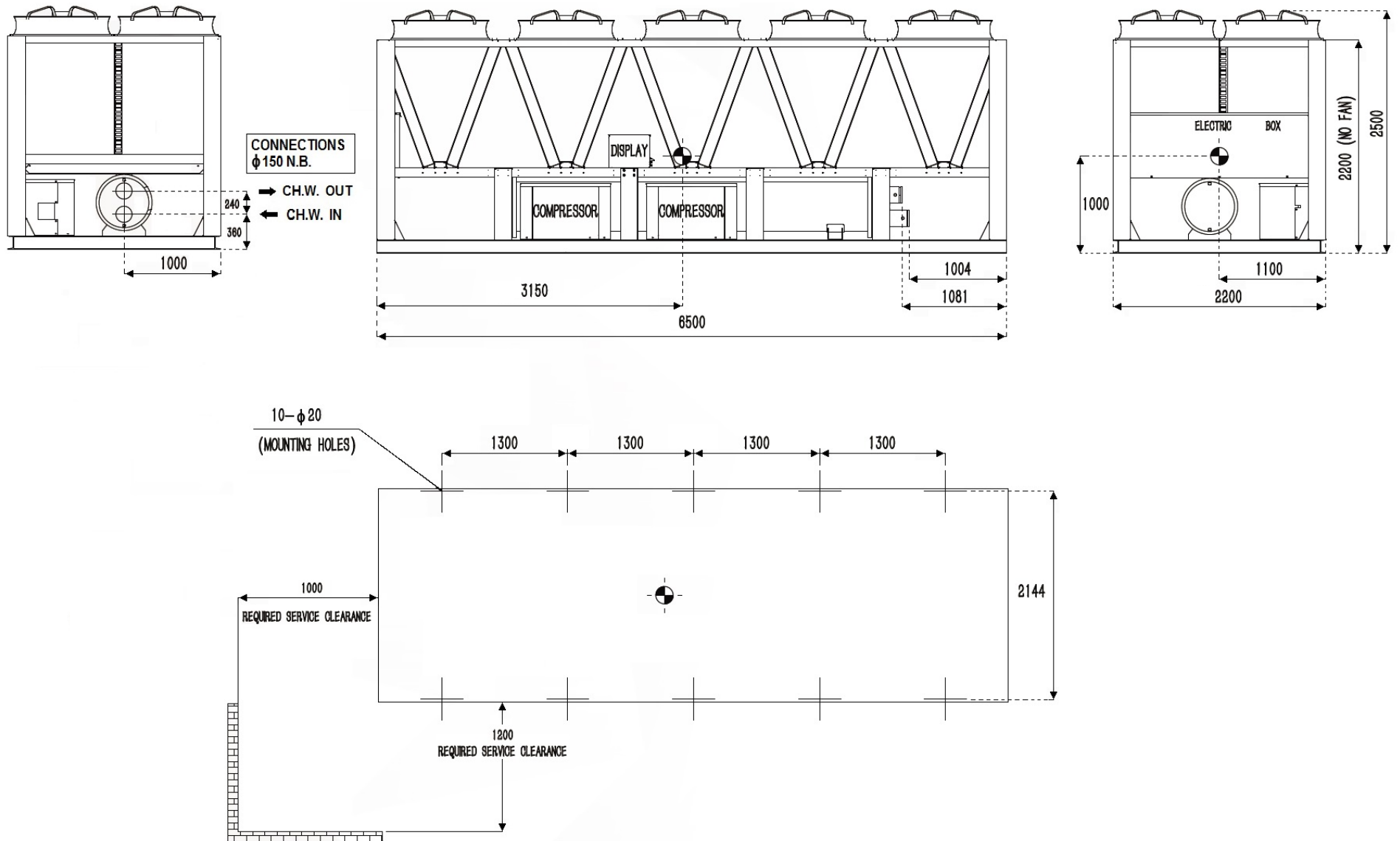
MTA125



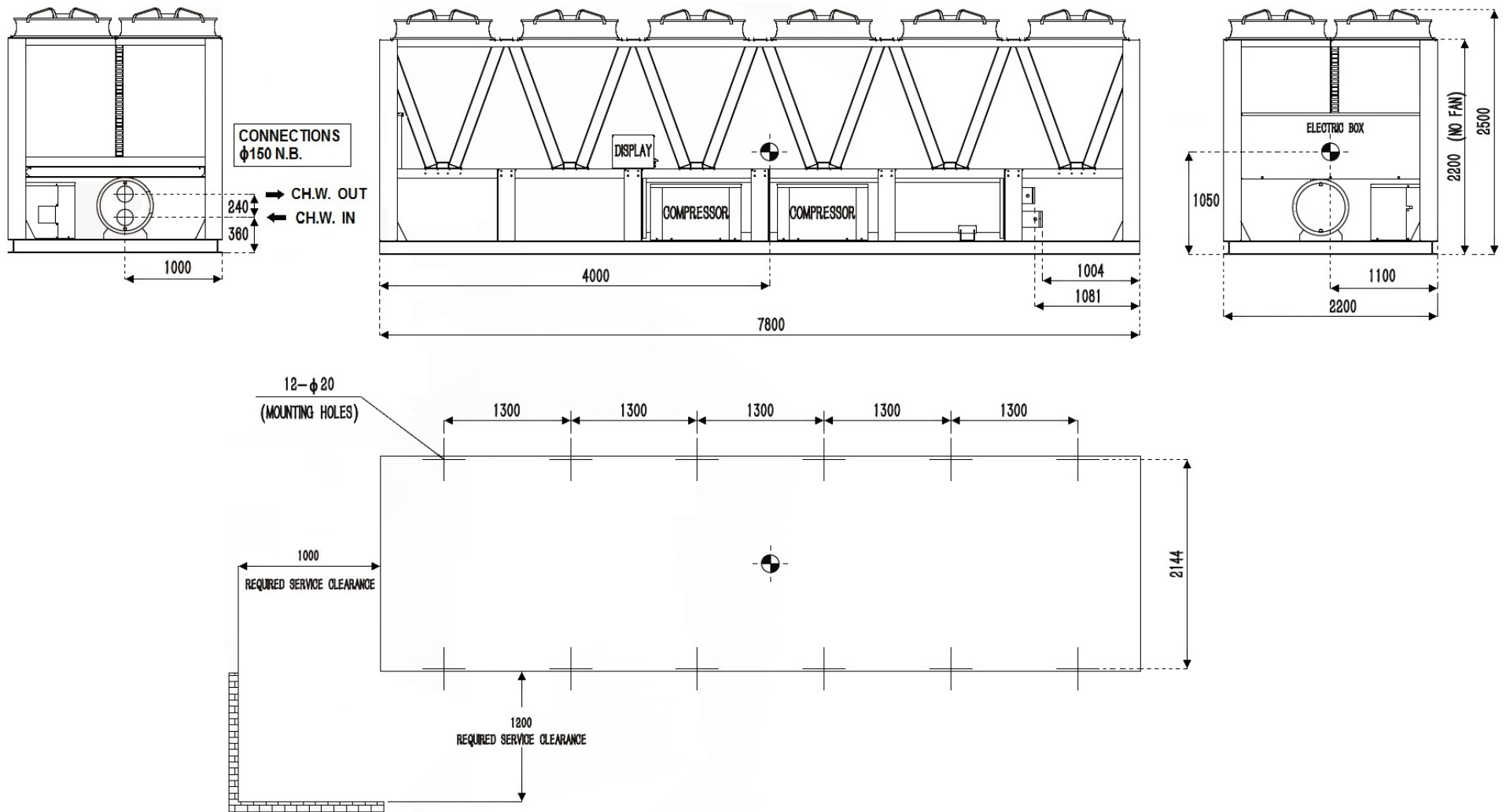
MTA160



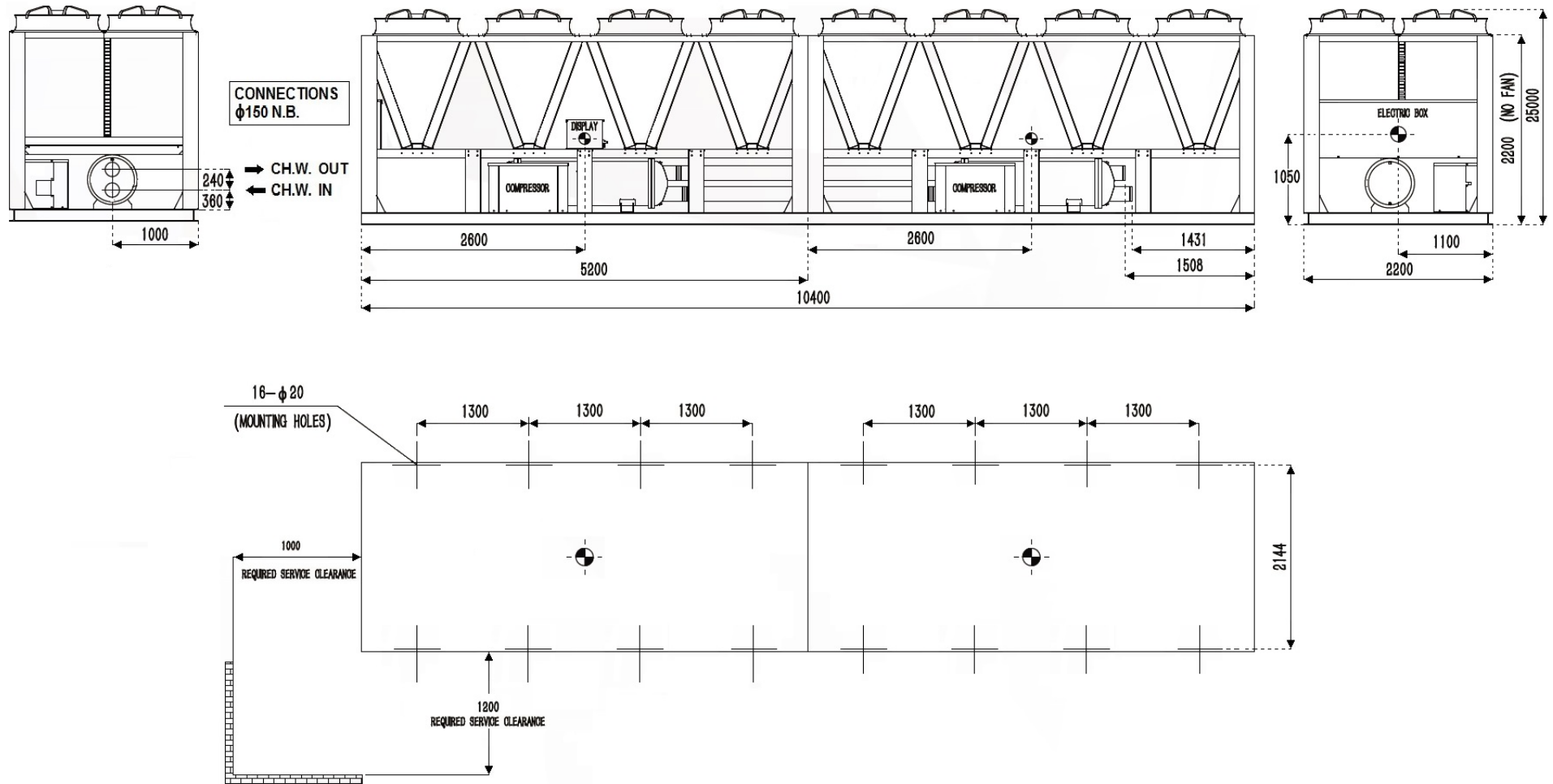
MTA180 / 190



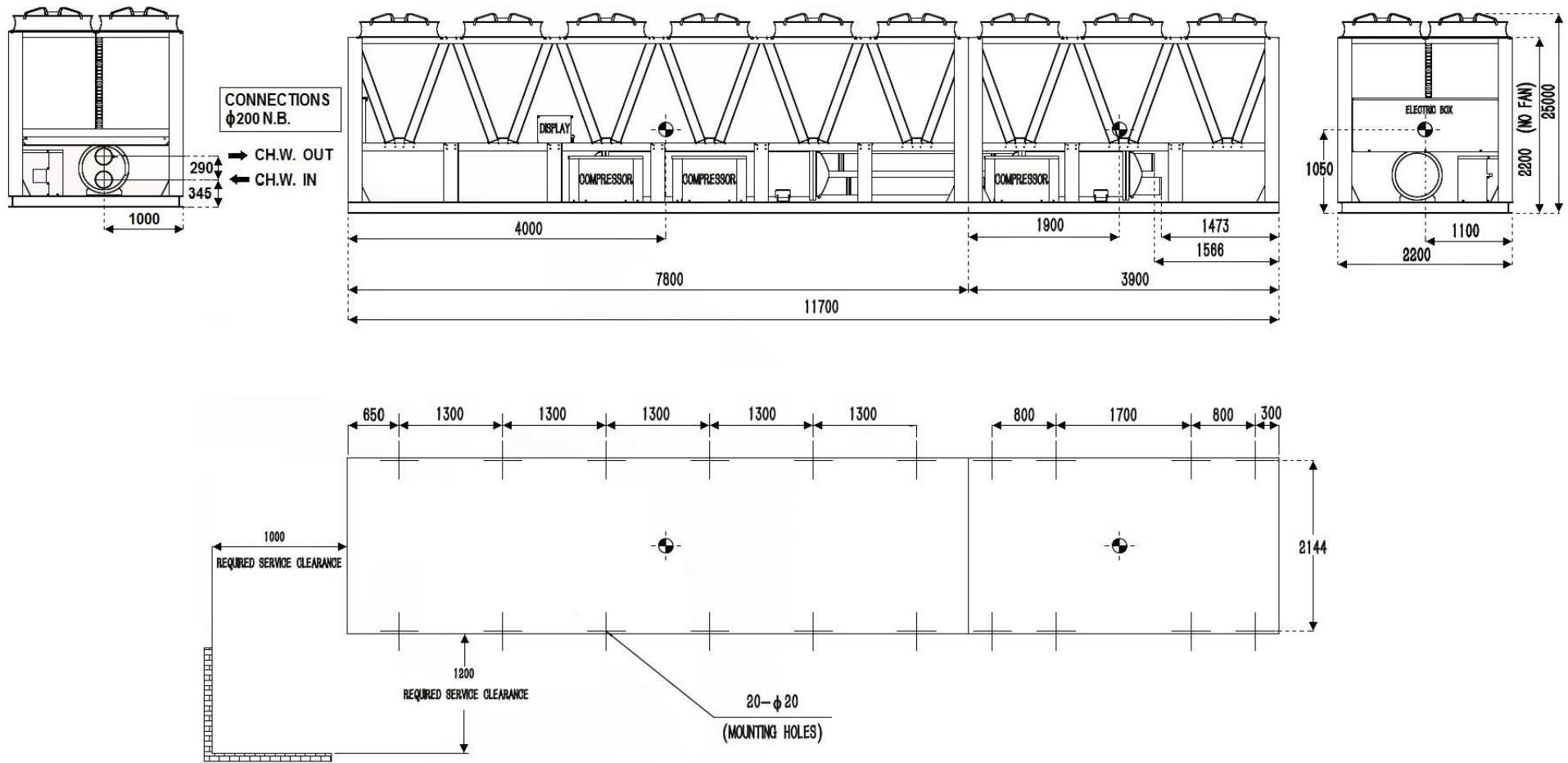
MTA200



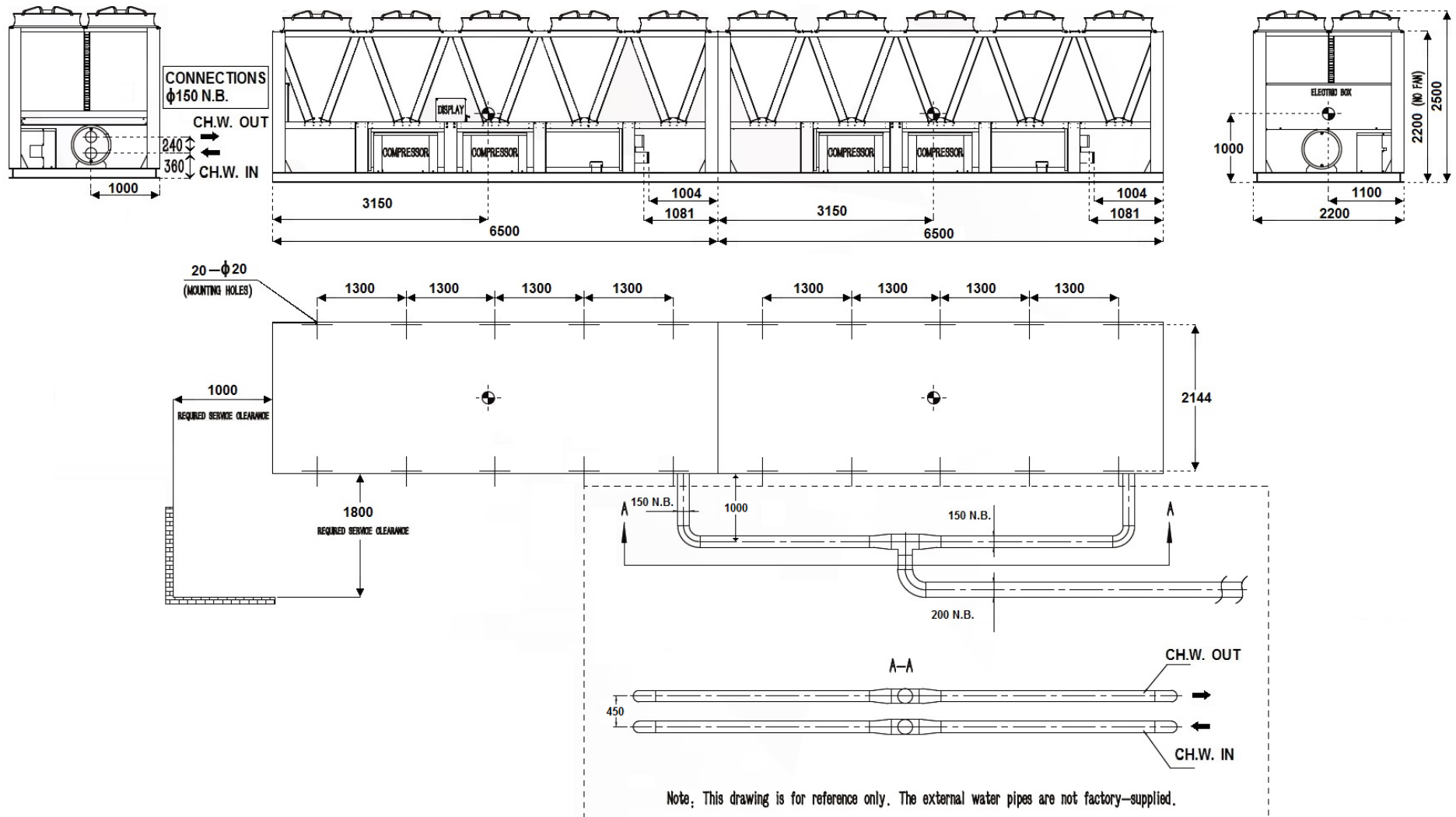
MTA240



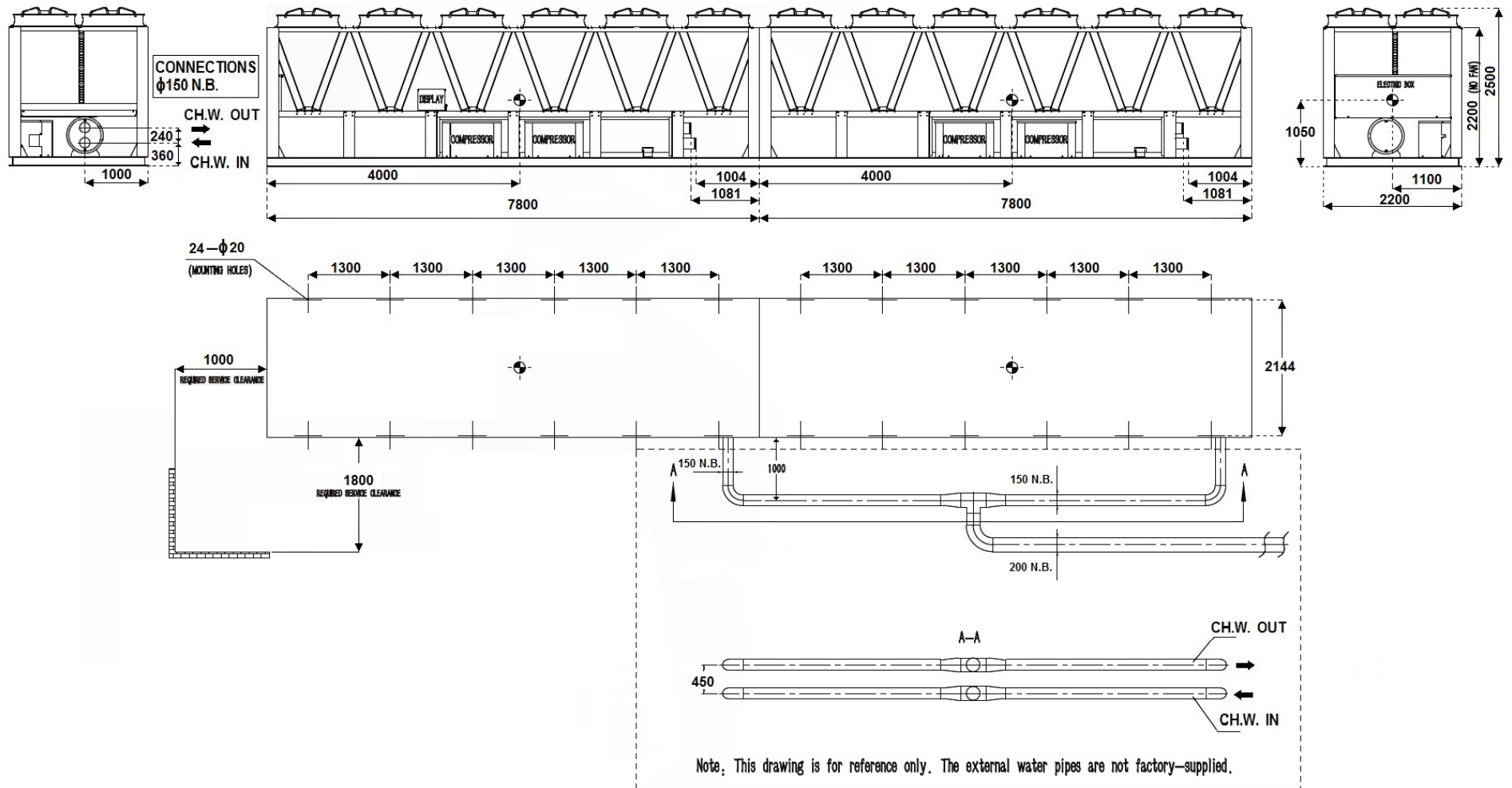
MTA300



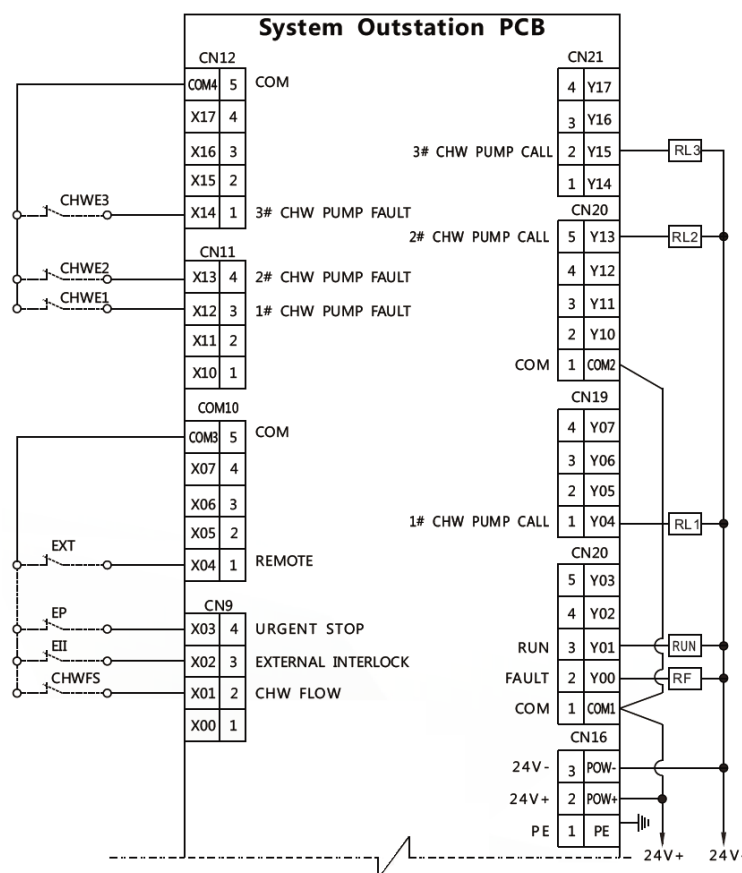
MTA350



MTA400



ELECTRICAL WIRING



External Interlock Devices:

DPCHW: chilled water differential pressure switch, verifying water flows;
 EII: external interlock signal;
 EP: external emergency stop input;
 EXT: external remote start/stop input;
 CHWE1~3: #1 - #3 chilled water pump fault signal;

Passive Contact Outputs:

System outstation PCB provides 5 passive contact outputs for users:

RF: chiller fault status output;
 RUN: chiller running status output;
 RL1~3: #1 - #3 chilled water pump running signal output;

Notes:

- Minimum cross section of control circuit conductor to be 0.75mm²;
- EII, EP, EXT and CHWE1~3 input signals to be bridged at factory. If these signals required to be connected to the system outstation PCB, corresponding jumper wires or jumper bars must be removed as per wiring diagram prior to input signal bridging.
- Maximum current of passive contact to be 5A;
- Flow switch and external interlock devices to be supplied by users or bought from MULTISTACK;
- VWF system to be free of flow switch;
- “—” for factory wiring and “--” for field wiring.

POWER CONNECTION

Electrical Performance Data

Model	Chiller				Compressor (each)			Fan (each)		
	AC400V±10% / 50Hz / 3Ph									
	No. of Compressors	No. of Fans	MOP (kW)	FLA (A)	RLA (A)	FLA (A)	MOP (kW)	RLA (A)	FLA (A)	MOP (kW)
MTA080	1	4	97.7	155	118	135	84.9	2.65	5	3.2
MTA090	1	6	104.1	165	131	135	84.9			
MTA100	1	6	142.5	240	155	210	123.3			
MTA120	1	8	148.9	250	190	210	123.3			
MTA125	1	10	155.3	260	189	210	123.3			
MTA160	2	8	195.4	310	118	135	84.9			
MTA180	2	10	201.8	320	131	135	84.9			
MTA190	2	10	278.6	470	145	210	123.3			
MTA200	2	12	285.0	480	151	210	123.3			
MTA240	2	16	297.8	500	184	210	123.3			
MTA300	3	18	427.5	720	151	210	123.3			
MTA350	4	20	403.6	640	125	135	84.9			
MTA400	4	24	570.0	960	155	210	123.3			

RLA: Rating Load Amperage **FLA:** Full Load Amperage **MOP:** Maximum Operating Power

Notes:

- These data are based on the same conditions as those for the cooling capacity. See the notes for the Unit General Data.
- The MOP is the total power of the unit under the following conditions:
 - Voltage Supply: Rated Voltage: *0.9
 - Chilled Water Outlet Temp.: 15°C
 - Condenser Air Inlet Temp.: 43°C
 - Load: 100%

Therefore, the sizes of wiring and fuses must be determined according to applicable national and local codes.

INSTALLATION AND OPERATION

1. MULTISTACK flooded air cooled oil-free centrifugal chillers can be installed in places with sufficient ventilation and convenience for installation, such as rooftop, balcony or just on the ground, to keep good convection heat transfer. If two or more chillers are installed with induced drafts facing one another, minimum 3 meters spacing is required between the induced drafts;
2. Distances between the flow switch and the upstream/downstream horizontal straight pipe should be at least 5 times pipe diameter to prevent damage on the chiller in the event of insufficient water flow. Flow switch is irreplaceable by differential pressure switch/transmitter on water headers; required setting of the flow switch: open when rated water flow $\leq 80\%$;
3. External pipes and valves shall have proper support so that their weights would not land on the chiller and guarantee good sealing of pipe connections.
4. Strainer should be installed in the inlet pipe. Strainer should be of stainless steel and sturdy enough in case that too much water pressure caused by partial blockage may damage the strainer.
5. After the temperature sensors are inserted to the sensor wells, grease lubricant should be applied into the sensor wells to protect temperature probes from being damaged by water accumulation inside the sensor well.
6. Prior to chiller operation, the whole piping system must be thoroughly cleaned and removed of mechanical impurities.
7. All piping components are to be supplied by the users.



MULTISTACK INTERNATIONAL LIMITED

17 FRIARS ROAD, MOORABBIN, VICTORIA 3189, AUSTRALIA

TELEPHONE: +61 3 8586 8200 FACSIMILE: +61 3 8586 8202

Email: sales@multistack.com.au

Website: <http://www.multistack.com.au/>

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01/2019 Rev. 1.0