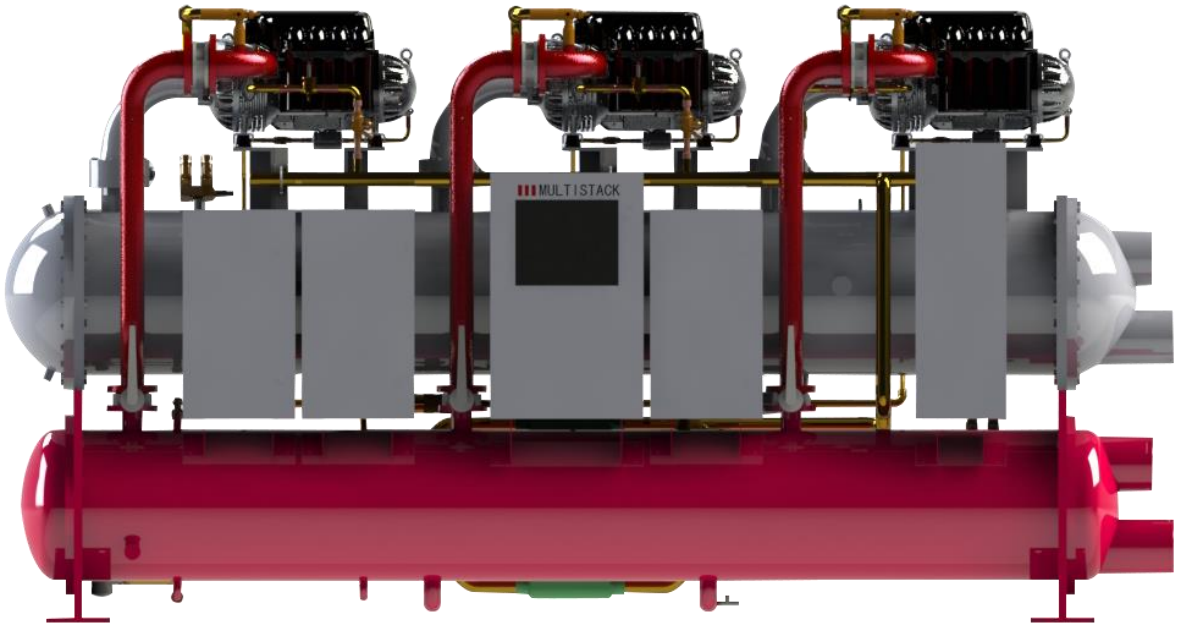
MULTISTACK
INTERNATIONAL LIMITED

MTW – F SERIES

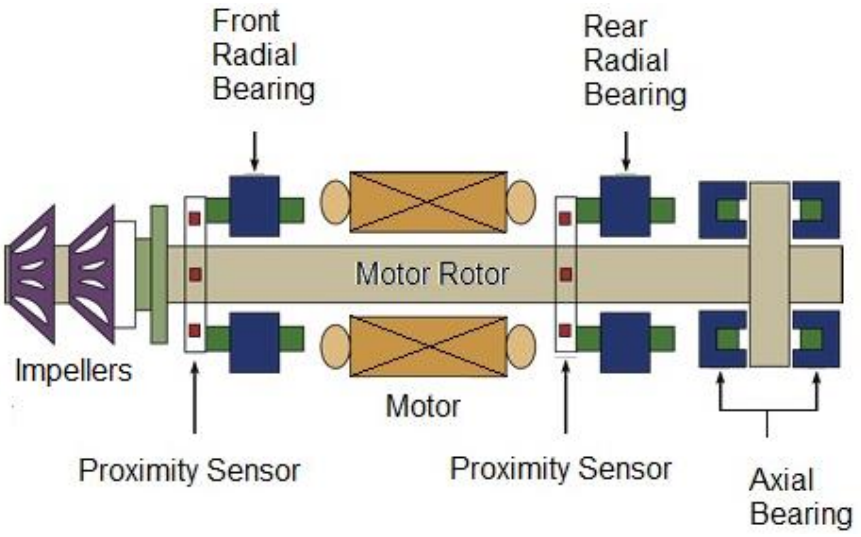
Flooded Oil-free Centrifugal Water Cooled Chiller

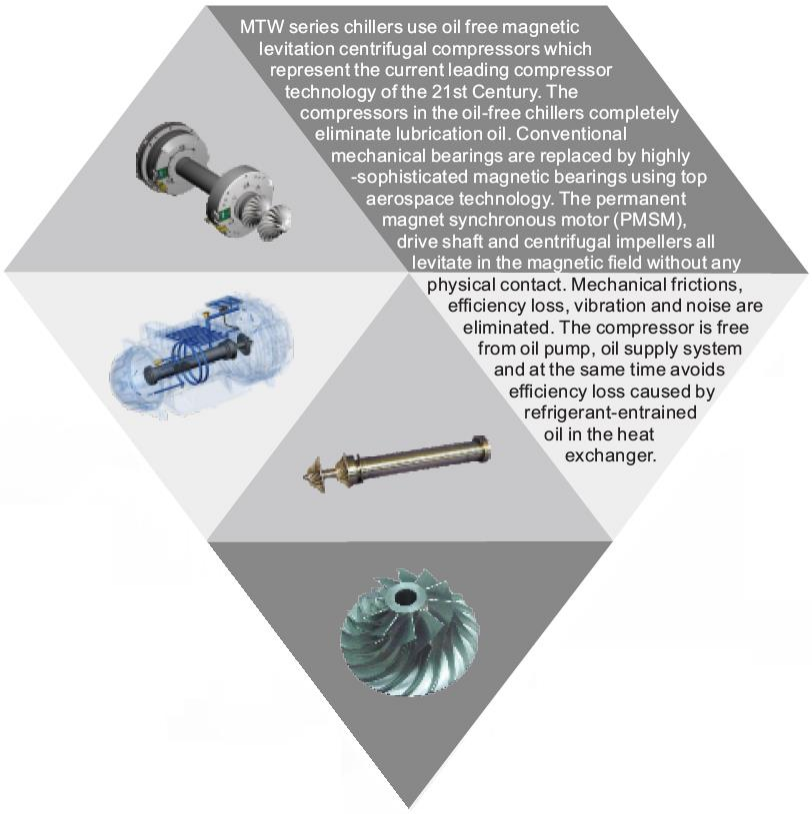


AHRI CERTIFIED
www.ahridirectory.org
Ask About Our Certified Products

Contents

OIL-FREE MAGNETIC LEVITATION CENTRIFUGAL COMPRESSOR





The oil-free centrifugal compressor is a totally digital part with an onboard digital control system monitoring all variables that may affect the safe operation of compressors. The control system consists of several multi-functional modules, including AC-DC converter module, magnetic bearing control module, soft-start module, inlet guide valve control module and communication module. All these modules are integrated in the compressor and make the compressor an electronic rather than a mechanical part.

When the condensing temperature and/or heating load change, variable frequency drive (VFD) control is utilized to regulate the compressor capacity with variable revolving speed of the motor and impellers based on actual load. With the application of VFD control, energy consumptions are reduced and part load efficiency is improved. Chiller will retain smooth running even in 10% part load. This is a great advantage over conventional chillers at part load conditions.

The internal insulated gate bipolar transistor (IGBT) acts as an inverter to convert DC voltage to three-phase adjustable AC voltage. The motor RPM is regulated based on the inverter frequency output, voltage and phases which are controlled through the motor signals and the proximity sensor signals. The compressor speed is smoothly confined within 15,000-38,000RPM based on load, suction/discharge pressure, running current and other conditions. Compared with 250-350 amps starting current of a conventional compressor, the oil-free centrifugal compressor pulls only 2 amps. The requirements for power distribution system and heat stress on the stator are accordingly reduced.

The compressor control system detects capacity required and compression ratio synchronously to match up with the revolving speed. Inlet guide valve control module continuously regulates the inlet guide vane open percentage and suction dynamic pressure in order to maximize operation at compressor sweet spots and avoid surge. In this way, the compressor can remain smooth operation without surge even at 30% part load condition or at low condenser water temperature. The compressor can even run at part load condition closed to 0% if the chiller has load balancing valve.

Proximity sensors in the magnetic bearing control module sense and reposition the impellor shaft 6 million times a minute to ensure the bearing is within a 0.007mm range.

In the event of a shutdown or power outage, the controller will detect power loss and switch the compressor motor to generator mode. In this mode, the bearing and control system are powered by both the power accumulator and the motor power generated by the inertial kinetic energy of the impellers and shaft. The revolving assembly remains levitating until it is brought to a safe stop without any friction. This is an unprecedented reliability feature of the compressor.

Advantages of Oil-free Feature

Oil Free = Enhanced Reliability
Oil-free system eliminates lubrication oil, oil pump, oil separator, oil cooler, oil heater, oil filter, oil pressure control system, oil tube and oil sump, etc. It makes a simpler compressor with enhanced reliability.

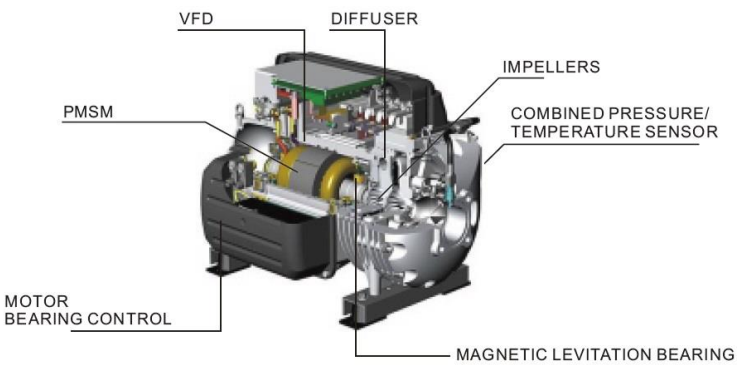
Oil Free = Improved Performance
Oil-free cooling system eliminates oil film formed on the surface of heat exchanger which leads to increasing evaporating temperature and decreasing condensing temperature. Efficiency is accordingly improved. Capacity decline caused by oil accumulation in the evaporator will not exist.

Oil Free = Increased Efficiency
Oil free means zero power consumption for oil pump, oil heater and oil cooler. Efficiency of the chiller is therefore increased.

Oil Free = Reduced Maintenance & Operating Costs
Maintenance and operating costs are reduced by getting rid of lubrication, replacements of oil, oil filter and evaporator refrigerant.

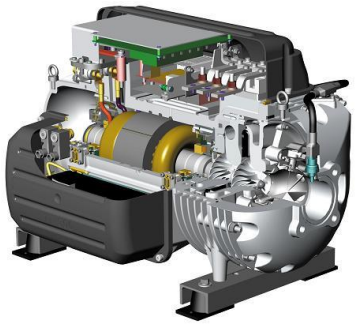
The compressor runs very quietly since it seldom generates mechanical friction or mechanical vibration. Sound level of the compressor measured at 5 meters horizontally around the chiller is as low as 65dB(A).

Advanced communication capability of the compressor enables it to connect to the Ethernet and makes it convenient for the users to access to the compressor running data via Web browser.



MULTISTACK FLOODED WATER COOLED OIL FREE CENTRIFUGAL CHILLER

Oil-Free Magnetic Levitation Centrifugal Compressor



Oil-free magnetic levitation centrifugal compressor is the perfect combination of top aerospace technology and advanced digital control technology. It is a 2-stage centrifugal compressor featuring light weight and enhanced mechanical intensity. It is not only enables small capacity compressor to share a same cooling system but also pushes the efficiency, reliability and redundancy to a higher standard. The compressor uses patented technology of magnetic bearing system with only one moving part, which eliminates vibration and allows the compressor to run extremely quiet.

Excellent Part Load Efficiency

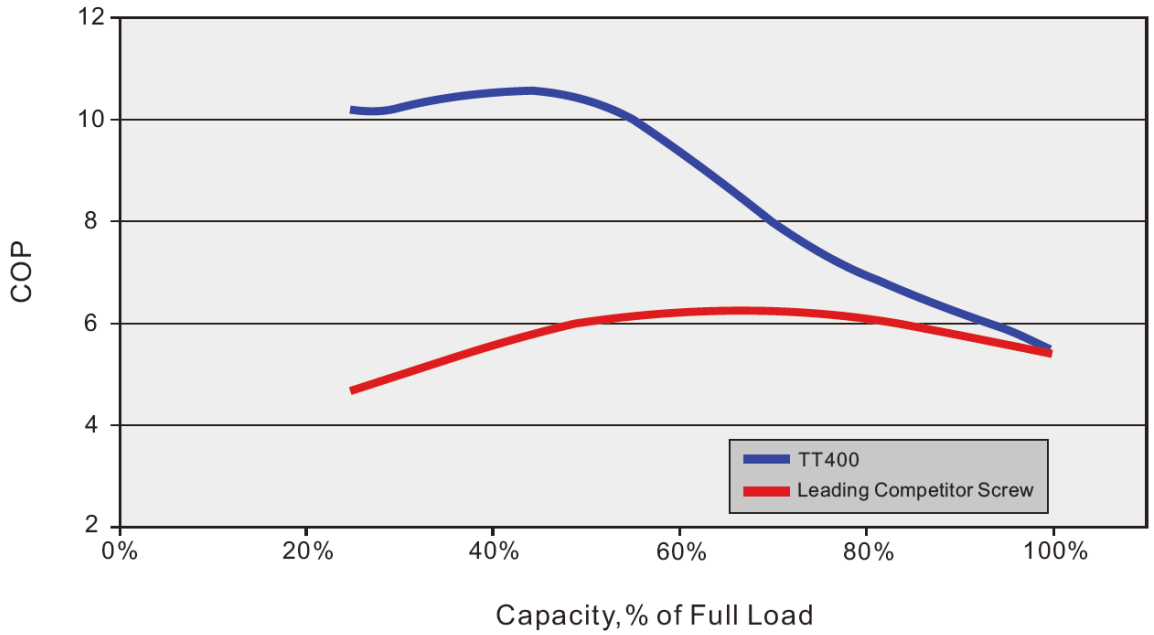
MTW-F compressors feature optimized part load efficiency. The special design and structure allow the compressors to run at part load condition as long as possible to achieve the best COP (W/W). When the cooling load decreases, MULTISTACK’ s unique MS ONE controller will shut down a certain number of compressors if necessary, leaving the rest to run at part load to meet the required capacity at high efficiency. With this self-adaptive control logic, a 450RT (1,600kW) MTW-F chiller can satisfy the required cooling capacity as low as 45RT (158kW) at high efficiency with Integrated Part Load Value (IPLV) of 10.95.

The use of multiple compressors allows the full play of redundancies of both evaporator and condenser at part load condition. This feature satisfies not only the building’ s best peak load efficiency but also the optimum operating efficiency at various part loads. IPLV can reach as high as 12 or even higher.

Compared with other chillers, power consumption of MTW-F chillers can be saved by about 42% and carbon emissions are equally reduced, undoubtedly meeting the needs of low carbon and energy-saving.

Part Load Efficiency:

MTW Chillers vs Conventional Chillers



Energy Saving:

MTW-F Chiller vs Other Leading Competitors Chiller

	Multistack MTW-F	Other Leading Competitor	Saving
Cooling Capacity (kW)	1583	1583	-
IPLV (kW/kW)	10.95	6.00	4.95
Average Annual Run Hours (1) (h)	3600	3600	3600-
Total Annual Consumption (kWh)	550800	948600	397800
Annual CO_2 Emissions (2) (metric Tons)	138.42	227.98	89.56

Remarks:

(1) Chiller annual run hours during Summer
(2) CO2 emission factor: 7.18 x 10-4 metric Tons (CO_2/kWh)

Notes:

Compared with conventional chillers, **MTW-F** magnetic levitation chillers can save operating costs by 42% or more and reduce CO_2 emissions with only 2-3 years of investment payback period.

Ultra Low Noise and Vibration

Main shaft of oil-free centrifugal compressor revolves at high speed without any mechanical contact with the bearing, achieving extremely low noise and vibration at either part load or full load condition.

Redundancy

Redundancy is very important to a chiller. However, it is usually overlooked for limited costs. MTW-F oil-free centrifugal chillers provide a solution by using multiple compressors sharing the same set of evaporator and condenser. Redundancy is then taken into consideration regardless of budget concerns. If one of the compressors encounters malfunction, others will remain in normal operation.

On the other hand, the efficiency of a conventional large centrifugal chiller will obviously decline when the load is lower than 50% of design load. This is a high-cost-consume design which hinders the chiller from achieving high efficiency at part load. In comparison, the MTW-F chiller uses a number of VFD oil-free centrifugal compressors. This design saves expenses for additional independent systems, providing better cost efficiency not only in peak hours but also at part load condition.

100% Oil-free Design

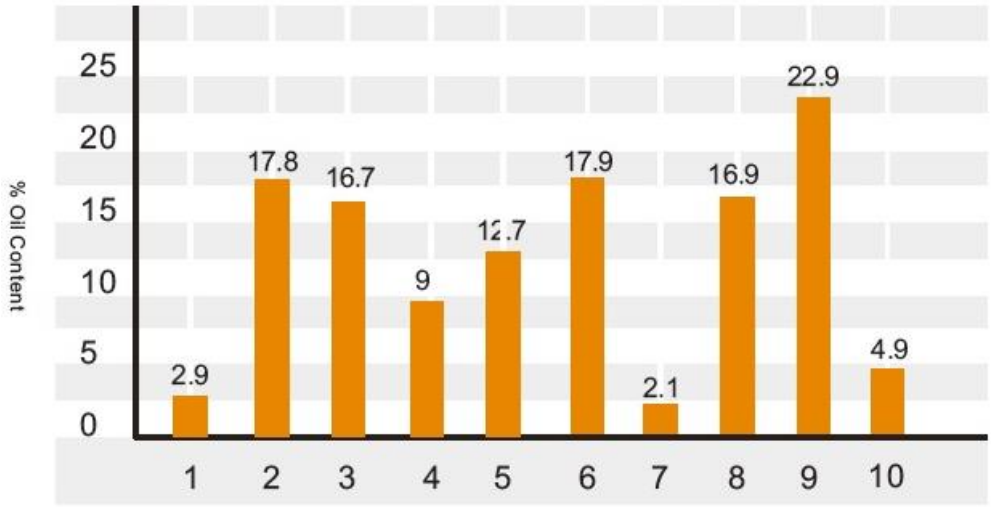
The rotor and impellers of the compressor remain levitating in the magnetic field. The proximity sensors on the bearing constantly send feedback to the magnetic bearing system, reposition the rotor and ensure that the rotor is levitating in the center, staying in the best working condition.

Oil-free magnetic centrifugal bearing promises quiet and reliable running of the compressor. Oil-free design eliminates complicated oil system, reduces operating maintenance costs and improves the chiller reliability and economy efficiency.

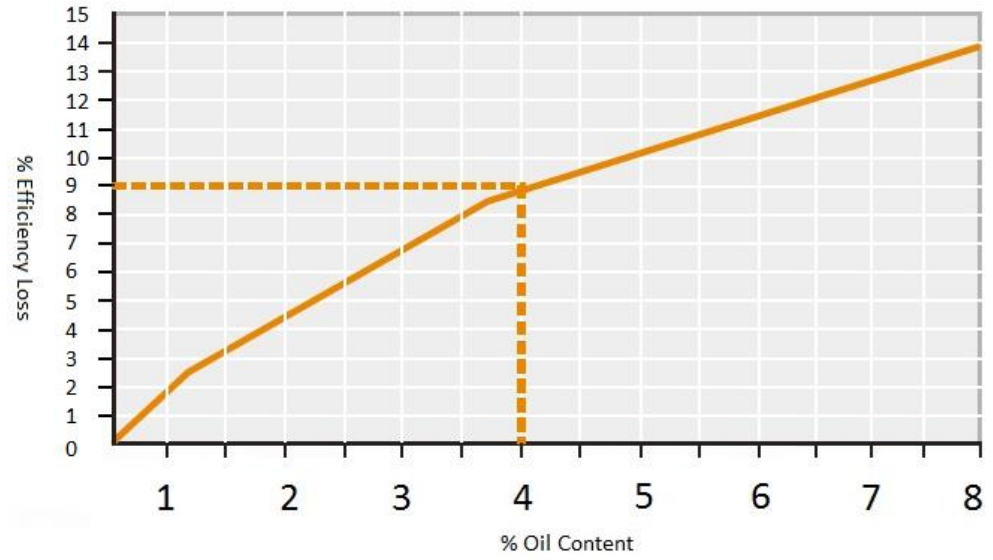
According to in-depth laboratory tests and a research project (601#) led by American Society of Heating Refrigerating and Air-conditioning Engineers (ASHRAE), refrigerant-entrained oil in the heat exchanger will greatly reduce chiller efficiency. Based on the 12% average oil content (data source from the research), oil built up in the evaporator will eventually causes declines on chiller performance and efficiency by about 18%. Since large centrifugal chillers must use lubrication oil and require annual maintenance (oil change, sampling, oil filter change and oil leakage handling). The need of heating up the oil sump may also result in more operation cost and maintenance cost. Nevertheless, because of the unavoidable refrigerant-entrained oil problem, lubrication oil will still greatly reduce the performance and efficiency of chillers.

MTW-F chillers operate without any lubrication oil which avoids declines of cooling capacity and efficiency.

ASHRAE Research Project 601#
Oil Content in Evaporator for Conventional Flooded Chiller Sample



How Much Does the Oil Decrease the Chiller Energy Efficiency



Flooded Evaporator

MTW-F chillers use high efficient flooded evaporator with enhanced tubes. Balanced feeding system is adopted to ensure that each tube is infiltrated into refrigerant to improve heat transfer.

The optimized structure design of an evaporator ensures performance as below:

- Approaching temperature between refrigerant and water $\leq$ 1.5k;
- Suction Superheat $\leq$ 1.0k;
- Minimum pressure drop;
- Optimum part load efficiency;
- Chilled water VWF (optional)

VICTAULIC coupling water connection of evaporator provides great convenience for field piping connection.

Electronic Expansion Valve (EXV)

MULTISTACK **MTW-F** chiller with multiple compressors features two electronic expansion valves for maximum redundancy and reliability. This feature allows the chiller to run one or two valves to always meter the proper amount of refrigerant. By using electronic valves in conjunction with level control, MTW-F chillers are able to unload further than chillers with only one large EXV, TXV or orifices.

Environment-friendly Refrigerant R134a

According to Montreal Convention, R11, R22 and some other refrigerants are forbidden to use in a time period because of their high ozone depletion. New products are not allowed to use such refrigerants. **MTW-F** oil-free centrifugal chillers use R134a with 0 ozone depletion potential (ODP). R134a is globally recognized to be the environment-friendly alternative refrigerant to HCFC. This allows for energy-efficient operation. Carbon emission is also reduced by 40%.

Factory-installed Differential Pressure Transducers

All MULTISTACK MTW-F chillers come with factory-installed differential pressure transducers on the evaporator and condenser. The transducers are plumbed and wired into the control system to decrease field installation requirements. Differential Pressure Transducers are used for protection in place of flow switches which flutters when used in variable flow applications and causing nuisance trips.

CONTROL SYSTEM

System Overview

MS One Control System consists of a 10.1 inch (optional 15 inch) touch screen and a dedicated HVAC programmable logic control panel. It is designed to provide operator, technical personnel and servicemen with real-time running information such as pressure, temperature, system status, faults, load history, run log and historic data, etc.

MS One Control System has options for duty/ standby modules, duty/standby units and others to maximize reliable, stable and safe operation of the HVAC system.

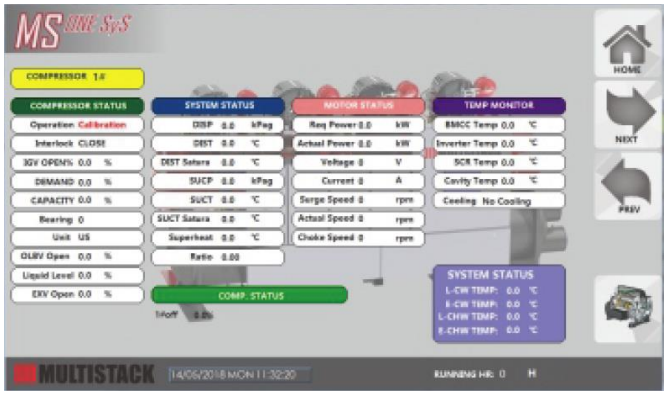
MS One Control System is supported with cloud platform control to enable information exchange via the internet, remote control of the chillers and monitoring running data via VNC and Easy Access 2.0.

MS One Control System is fitted with Ethernet, RS485, RS232 and USB ports. Enable MS ONE Controller connecting to Building Automation System (BAS) or Distributed Control System (DCS) and various protocols.

Main Screen

The control system consists of programs, touch screen and system input/output. Features of MS ONE controller mainly includes:

- Chilled Water Temperature Monitor
- Cooling Water Flow Monitor (water-cooled only)
- Compressor Status Index
- Chiller Running Status Index
- Operation History Record Index
- Advanced Setting Index
- COMP Power Input and Current
- Percentage of Load Demand



Compressor Screen

This is where a detail status for one of the compressors can be found. Features of this page mainly includes:

* Compressor Real-time Status
* Chiller System Status (Refrigerant Side)
* Motor Status (Power, Voltage, Speed, etc.)
* Compressor's Temperature Monitor

PHYSICAL DATA

Per Unit

Model No.		125	150	200	250	300	400
Nominal Cooling Capacity (kW)		440	528	703	879	1055	1407
Power Input (kW)		73.4	86.6	110.8	150.2	173.4	222.8
COP (w/w)		6.00	6.10	6.34	5.85	6.08	6.31
IPLV (w/w)		10.33	10.80	10.89	10.35	10.98	11.20
Control System		MS One Controller					
Compressor	Type	Magnetic Levitation Oil Free Centrifugal					
	Control Stages (%)	30-100	30-100	30-100	15-100	15-100	15-100
	FLA per Comp. (A)	210	170	206	210	170	206
Power Supply		AC415V/ 50Hz /3Ph					
Evaporator	Type	Flooded Shell & Tube					
	CH.W. Flow Rate (m^3/h)	75.7	90.8	120.9	151.2	181.4	241.9
	Water Pressure Drop (kPa)	105.9	98.4	94.3	62.2	81.6	81.7
	Fouling Factor (m^2k/kW)	0.018					
	Max. Working Pressure (kPa) (Water Side)	1000					
	Water Connection Size	6”	6”	6”	6”	8”	8”
Condenser	Type	Flooded Shell & Tube					
	C.W. Flow Rate (m^3/h)	88.3	105.7	139.9	177.0	211.2	280.3
	Water Pressure Drop (kPa)	69.6	68.3	79.4	51.2	56.0	68.0
	Fouling Factor (m^2k/kW)	0.044					
	Max. Working Pressure (kPa) (Water Side)	1000					
	Water Connection Size	6”	6”	6”	6”	8”	8”
Refrigerant		R134a					
Refrigerant charge (kg)		125	170	200	250	320	380
Dimension	L (mm)	2598	2598	2598	3704	4301	4301
	W (mm)	976	976	1081	976	976	1081
	H (mm)	1999	1999	2098	2057	2057	2148
Shipping weight (kg)		2150	2450	2900	4300	4900	5300
Operation weight (kg)		2300	2600	3100	4700	5300	5800

F.L.A. = Full Load Amperage

Nominal Values based on:

- Chilled Water Leaving Temp. 7°C
- Chilled Water Entering Temp. 12°C
- Condenser Water Leaving Temp. 35°C
- Condenser Water Entering Temp. 30°C

Note:

MTW-F Series Chiller is rated and constructed in compliance with ARHR Standard 551/591 (SI) Performance rating of Water-chilling and Heat Pump Water-heating Packages using the Vapor Compression Cycle.

PHYSICAL DATA

Per Unit

Model No.		450	600	750	800	900	1000
Nominal Cooling Capacity (kW)		1583	2110	2638	2814	3165	3517
Power Input (kW)		259.5	345.1	431.6	442.7	513.3	554.0
COP (w/w)		6.10	6.11	6.11	6.36	6.17	6.35
IPLV (w/w)		10.95	11.03	11.02	11.28	11.10	11.22
Control System		MS One Controller					
Compressor	Type	Magnetic Levitation Oil Free Centrifugal					
	Control Stages (%)	10-100	7.5-100	6-100	7.5-100	5-100	6-100
	FLA per Comp. (A)	170	170	170	206	170	206
Power Supply		AC415V/ 50Hz /3Ph					
Evaporator	Type	Flooded Shell & Tube					
	CH.W. Flow Rate (m^3/h)	272.2	362.8	453.6	483.9	544.3	604.8
	Water Pressure Drop (kPa)	75.0	76.3	68.2	68.1	93.9	76.1
	Fouling Factor (m^2k/kW)	0.018					
	Max. Working Pressure (kPa) (Water Side)	1000					
	Water Connection Size	8”	10”	12”	12”	12”	12”
Condenser	Type	Flooded Shell & Tube					
	C.W. Flow Rate (m^3/h)	316.8	422.2	527.8	560.0	632.5	700.1
	Water Pressure Drop (kPa)	55.9	53.3	52.2	46.3	63.9	55.2
	Fouling Factor (m^2k/kW)	0.044					
	Max. Working Pressure (kPa) (Water Side)	1000					
	Water Connection Size	8”	10”	12”	12”	12”	14”
Refrigerant		R134a					
Refrigerant charge (kg)		440	690	780	880	990	1060
Dimension	L (mm)	4352	4376	4361	4430	4930	4555
	W (mm)	1912	2021	2382	2325	2325	2559
	H (mm)	1998	2165	2177	2205	2225	2326
Shipping weight (kg)		6800	9100	10250	11000	12500	13460
Operation weight (kg)		7500	9200	11500	12300	14000	14960

F.L.A. = Full Load Amperage

Nominal Values based on:

- Chilled Water Leaving Temp. 7°C
- Chilled Water Entering Temp. 12°C
- Condenser Water Leaving Temp. 35°C
- Condenser Water Entering Temp. 30°C

Note:

MTW-F Series Chiller is rated and constructed in compliance with ARHR Standard 551/591 (SI) Performance rating of Water-chilling and Heat Pump Water-heating Packages using the Vapor Compression Cycle.

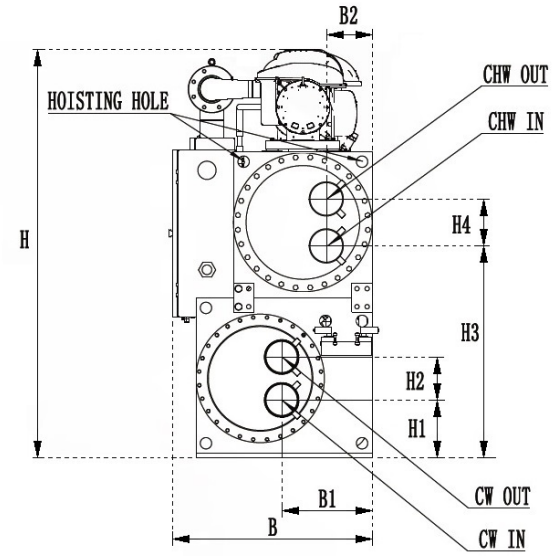
MODEL NUMBER DESIGNATION

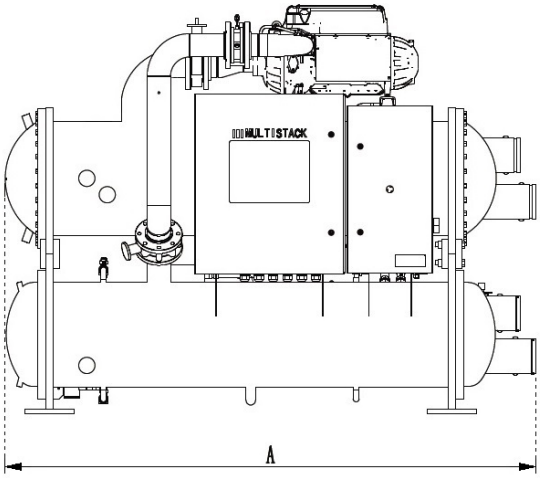
MT	W	150	F	E	A
1	2	3	4	5	6

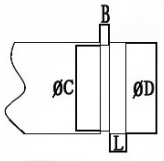
1. Multistack Turbocor compressor
2. Cooling type:
   - A: Air cooled
   - W: Water cooled
3. Model Number
4. F: Flooded Shell & Tube Evaporator
5. Refrigerant
   - E: R134a
6. Electrical Specifications:
   - A: AC400V ± 10% / 50Hz / 3Ph
   - B: AC380V / 60Hz / 3Ph
   - C: AC440-460V / 60Hz / 3Ph

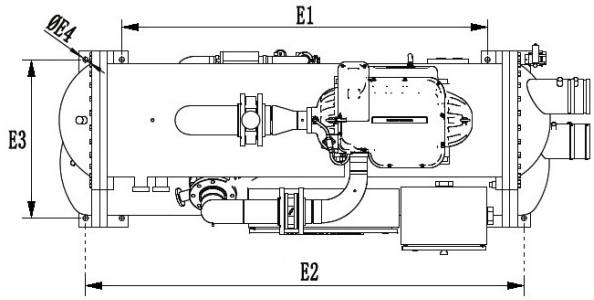
PHYSICAL DIMENSIONS

MTW 125F
MTW 150F
MTW 200F









INDENTATION SIZE OF COUPLING DN150

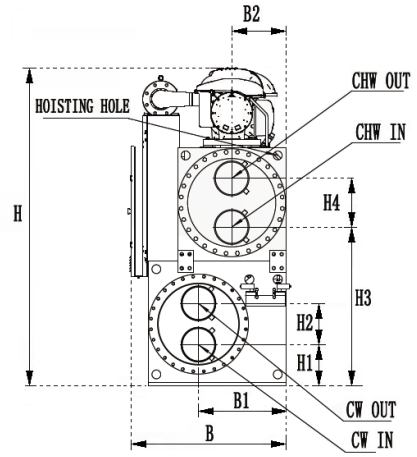
PIPE(O.D)"D"(RAW)			GROOVE TO END FACE "L"			GROOVE WIDTH "B"			GROOVE(O.D) "C"		
STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.
165.1	166.7	164.3	15.9	16.6	15.1	8.74	9.50	7.98	160.5	160.78	160.22

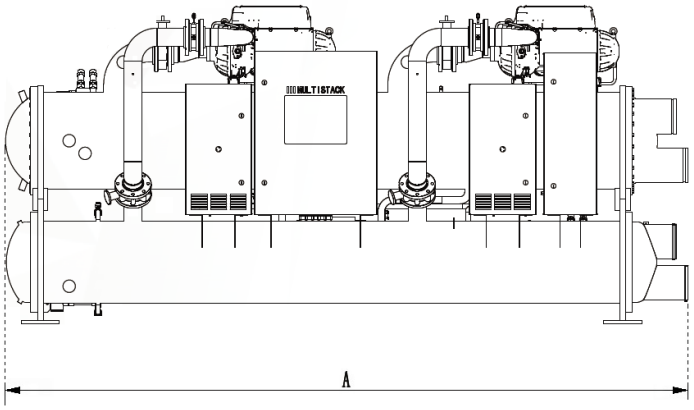
MODEL	LENGTH A(mm)	WIDTH B(mm)	HEIGHT H(mm)	MOUNTING FOOT SIZE(mm)				HEADER POSITIONING SIZE(mm)						CONNECTION SIZE	WEIGHT (kg)
				E1	E2	E3	E4	H1	H2	H3	H4	B1	B2		
MTW125F	2598	976	1999	1790	2146	775	25	272	230	1035	230	444	225	DN150	2150
MTW150F	2598	976	1999	1790	2146	775	25	272	230	1035	230	444	225	DN150	2450
MTW200F	2598	1081	2098	1790	2146	905	25	292	240	1105	240	549	250	DN150	2900

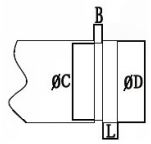
Note:

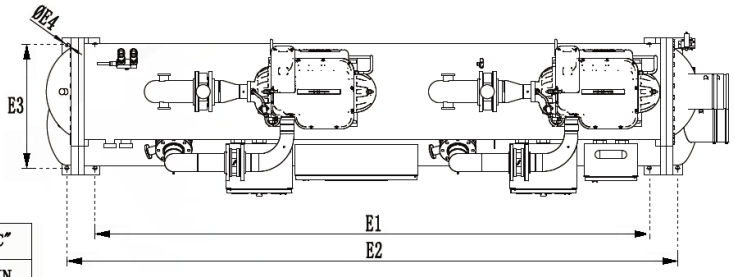
Rubber vibration pads should be applied with 300mm intervals (not supplied by MULTISTACK)

MTW 250F
MTW 300F
MTW 400F









INDENTATION SIZE OF COUPLING DN200

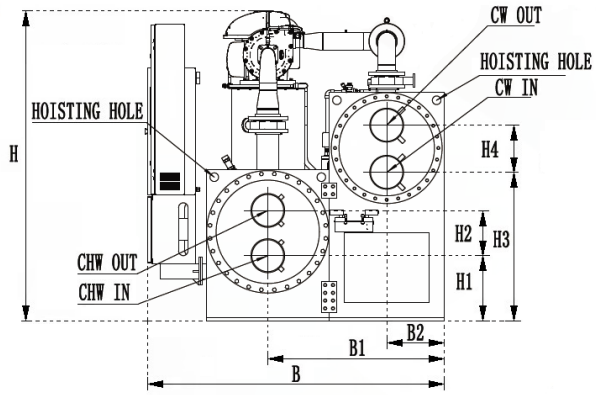
PIPE(O.D)"D"(RAW)			GROOVE TO END FACE "L"			GROOVE WIDTH "B"			GROOVE(O.D) "C"		
STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.
219.1	220.7	218.3	19.1	19.8	18.3	11.91	12.67	11.15	213.3	213.70	212.98

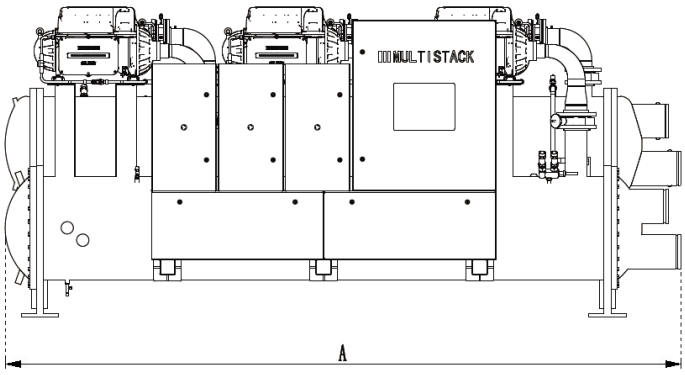
MODEL	LENGTH A(mm)	WIDTH B(mm)	HEIGHT H(mm)	MOUNTING FOOT SIZE(mm)				HEADER POSITIONING SIZE(mm)						CONNECTION SIZE	WEIGHT (kg)
				E1	E2	E3	E4	H1	H2	H3	H4	B1	B2		
MTW250F	3704	976	2057	2896	3252	775	25	252	270	997	306	549	340	DN200	4300
MTW300F	4301	976	2057	3490	3846	775	25	252	270	997	306	549	340	DN200	4900
MTW400F	4301	1081	2148	3490	3846	905	25	267	290	1072	306	654	365	DN200	5300

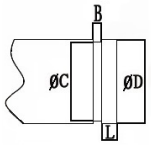
Note:

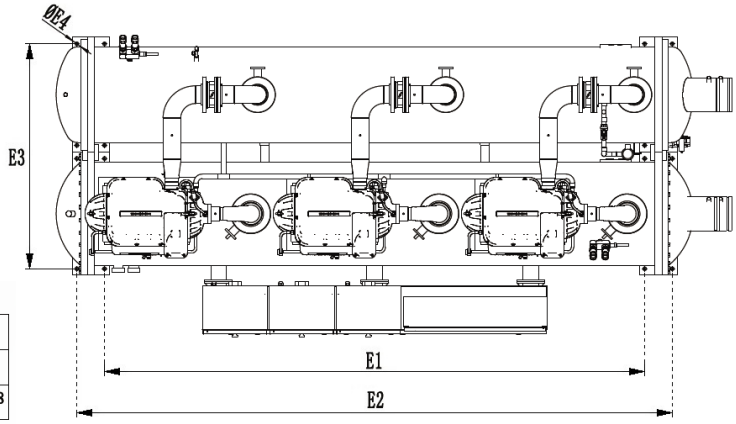
Rubber vibration pads should be applied with 300mm intervals (not supplied by MULTISTACK)

MTW 450F









INDENTATION SIZE OF COUPLING DN200

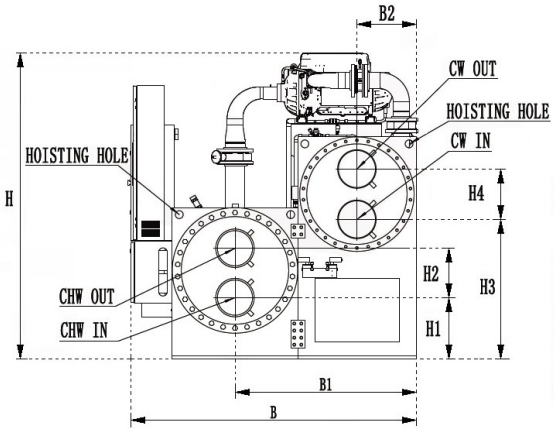
PIPE(O.D)"D"(RAW)			GROOVE TO END FACE "L"			GROOVE WIDTH "B"			GROOVE(O.D) "C"		
STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.
219.1	220.7	218.3	19.1	19.8	18.3	11.91	12.67	11.15	213.3	213.70	212.98

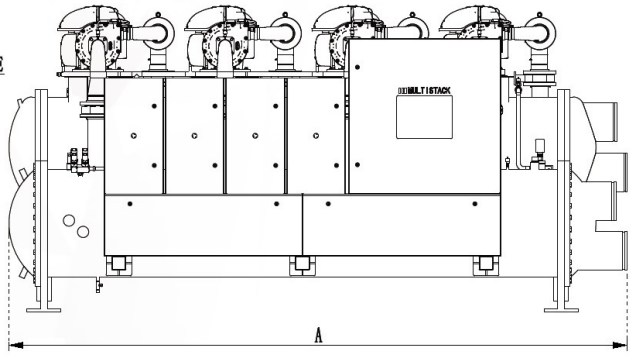
MODEL	LENGTH A(mm)	WIDTH B(mm)	HEIGHT H(mm)	MOUNTING FOOT SIZE(mm)				HEADER POSITIONING SIZE(mm)						CONNECTION SIZE	WEIGHT (kg)
				E1	E2	E3	E4	H1	H2	H3	H4	B1	B2		
MTW450F	4352	1912	1998	3481	3837	1449	25	419	292	956	304	1138	372	DN200	6800

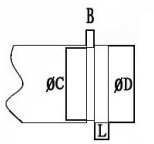
Note:

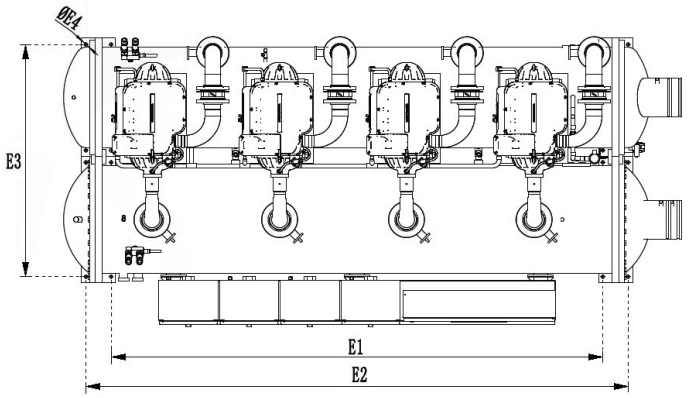
Rubber vibration pads should be applied with 300mm intervals (not supplied by MULTISTACK)

MTW 550F
MTW 660F
MTW 800F









INDENTATION SIZE OF COUPLING DN250

PIPE(O.D)"D"(RAW)			GROOVE TO END FACE "L"			GROOVE WIDTH "B"			GROOVE(O.D) "C"		
STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.
273.0	274.6	272.2	19.1	19.8	18.3	11.91	12.67	11.15	267.3	267.60	266.93

INDENTATION SIZE OF COUPLING DN300

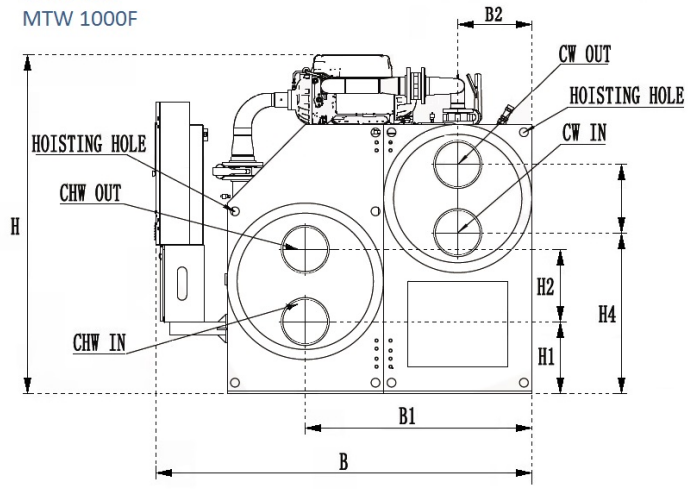
PIPE(O.D)"D"(RAW)			GROOVE TO END FACE "L"			GROOVE WIDTH "B"			GROOVE(O.D) "C"		
STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.
325	326.6	324.2	19.1	19.8	18.3	11.91	12.67	11.15	317.9	318.29	317.53

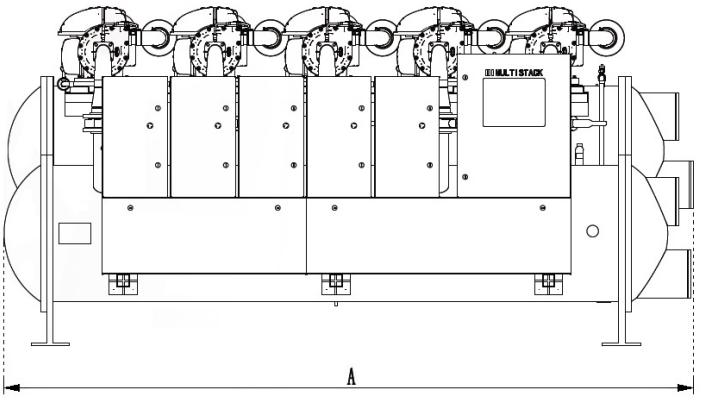
MODEL	LENGTH A(mm)	WIDTH B(mm)	HEIGHT H(mm)	MOUNTING FOOT SIZE(mm)				HEADER POSITIONING SIZE(mm)						CONNECTION SIZE	WEIGHT (kg)
				E1	E2	E3	E4	H1	H2	H3	H4	B1	B2		
MTW550F	4376	2021	2165	3481	3837	1643	25	433	349	987	356	1283	419	DN250	7600
MTW600F	4376	2021	2165	3481	3837	1643	25	433	349	987	356	1283	419	DN250	8200
MTW800F	4430	2325	2205	3481	3837	1916	25	443	457	1015	420	1485	485	DN300	11000

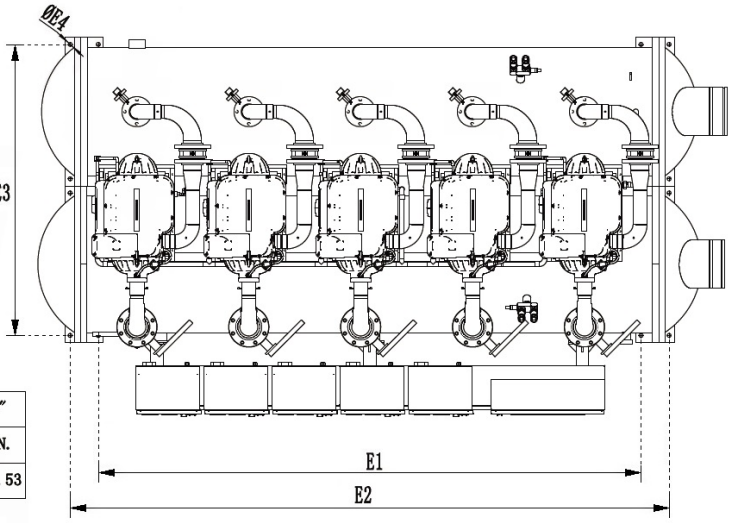
Note:

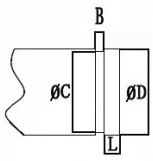
Rubber vibration pads should be applied with 300mm intervals (not supplied by MULTISTACK)

MTW 750F
MTW 1000F









INDENTATION SIZE OF COUPLING DN300

PIPE(O.D)"D"(RAW)			GROOVE TO END FACE "L"			GROOVE WIDTH "B"			GROOVE(O.D) "C"		
STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.
325	326.6	324.2	19.1	19.8	18.3	11.91	12.67	11.15	317.9	318.29	317.53

INDENTATION SIZE OF COUPLING DN350

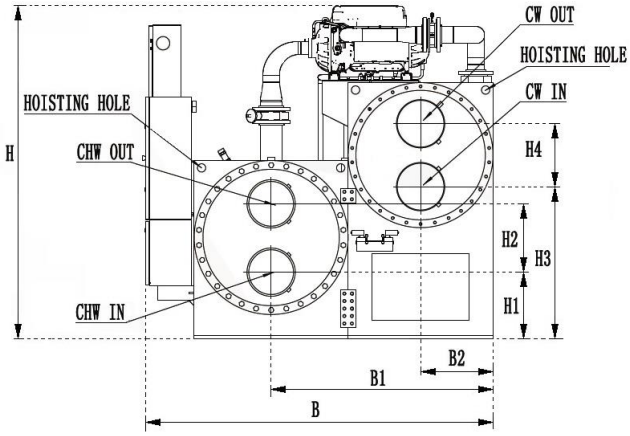
PIPE(O.D)"D"(RAW)			GROOVE TO END FACE "L"			GROOVE WIDTH "B"			GROOVE(O.D) "C"		
STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.
377	378.6	376.2	23.9	24.7	23.1	12.7	13.5	11.9	371.5	372.3	370.7

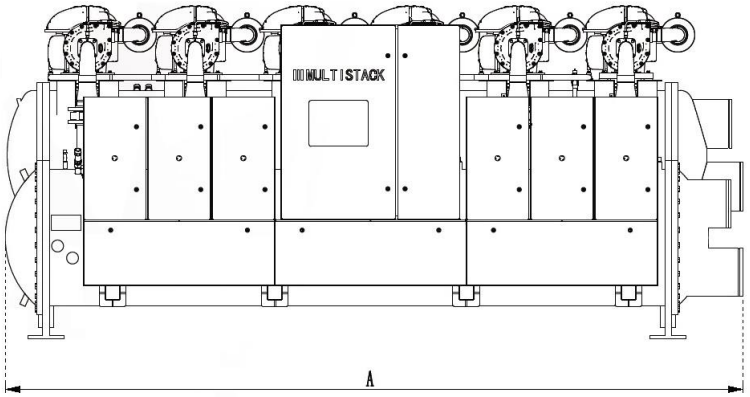
MODEL	LENGTH A(mm)	WIDTH B(mm)	HEIGHT H(mm)	MOUNTING FOOT SIZE(mm)				HEADER POSITIONING SIZE(mm)						CONNECTION SIZE	WEIGHT (kg)
				E1	E2	E3	E4	H1	H2	H3	H4	B1	B2		
MTW750F	4490	2238.5	2225	3481	3837	1815.5	25	443	457	1009	426	1410	460	DN300	10250
MTW1000F	4555	2558.5	2325.3	3481	3837	2115.5	25	443	509	1110	460	1615	515	CHW:DN300 CW:DN350	13460

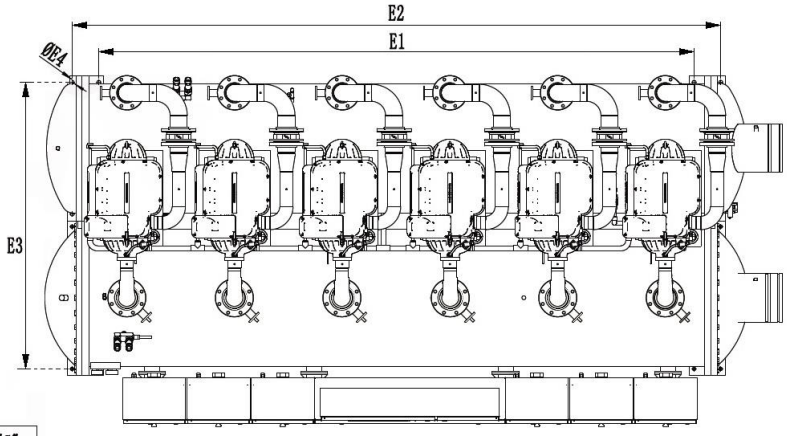
Note:

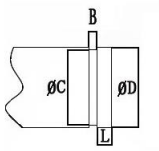
Rubber vibration pads should be applied with 300mm intervals (not supplied by MULTISTACK)

MTW 900F









INDENTATION SIZE OF COUPLING DN300

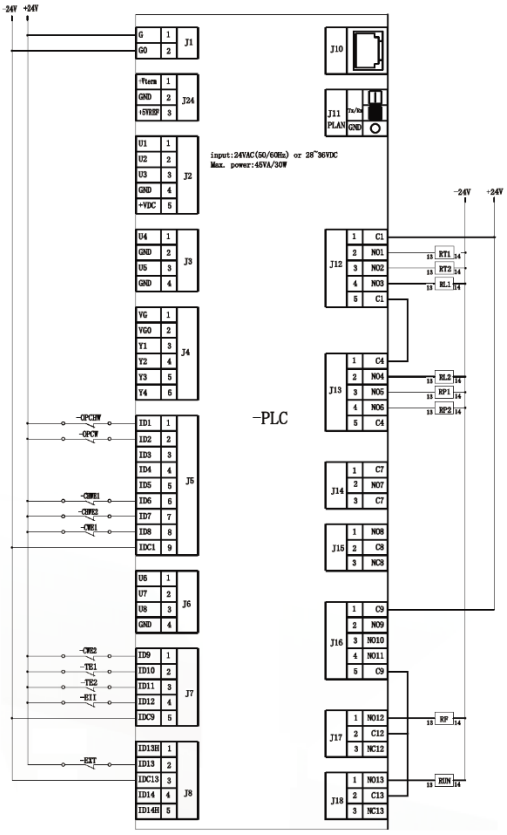
PIPE(O.D)"D"(RAW)			GROOVE TO END FACE "L"			GROOVE WIDTH "B"			GROOVE(O.D) "C"		
STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.	STD.	MAX.	MIN.
325	326.6	324.2	19.1	19.8	18.3	11.91	12.67	11.15	317.9	318.29	317.53

MODEL	LENGTH A(mm)	WIDTH B(mm)	HEIGHT H(mm)	MOUNTING FOOT SIZE(mm)				HEADER POSITIONING SIZE(mm)						CONNECTION SIZE	WEIGHT (kg)
				E1	E2	E3	E4	H1	H2	H3	H4	B1	B2		
MTW900F	4930	2325	2225	3981	4337	1916	25	443	457	1015	420	1485	485	DN300	12500

Note:

Rubber vibration pads should be applied with 300mm intervals (not supplied by MULTISTACK)

Electrical System Wiring



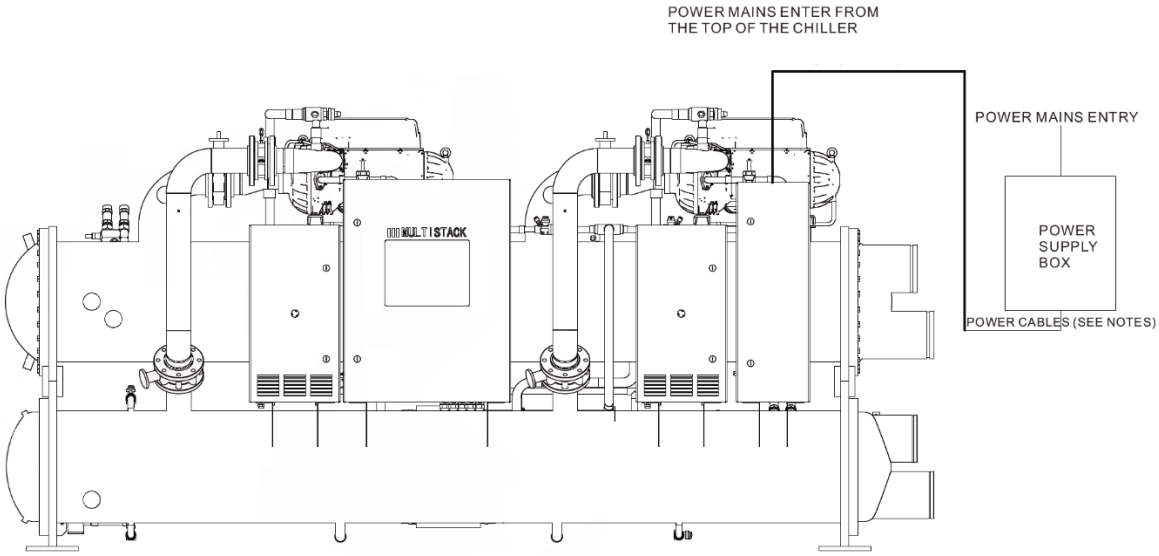
Notes:

OPCHW:	Chilled water differential pressure switch, verifying water flows;
OPCW:	Cooling water differential pressure switch;
CHWE1~2:	#1-#2 Chilled water pump fault signal;
CHWE1~2:	#1-#2 Cooling water pump alarm input;
TE1~2:	#1-#2 Cooling tower alarm input;
EXT:	External remote start/stop input;
EII:	External interlock signal;
RL1~2:	#1-#2 Chilled water pump running signal output;
RT1~2:	#1-#2 Cooling tower on/off relay;
RF:	Chiller fault status output;
RUN:	Chiller running status output.

Wiring Considerations:

- Minimum cross section size of control wire to be 1mm2;
- Inputs to terminals ID12 and ID13 to be bridged to common port G as per wiring diagram if EII and EXT are not used;
- Maximum current allowable for passive contact to be 5A;
- External interlock devices to be supplied by users;
- The flow switches have been factory-installed and wired;
- "—" for factory wiring and "--" for field wiring.

Power Mains Connection



Notes:

1. This drawing is for reference only. Actual size and electrical control box are subject to specific model
2. When starting the chiller, the compressor will start stage by stage. Chiller starting current is equal to the total current of operating compressors plus the starting current of the compressor(s) being actuate
3. The selection of power mains should base on the voltage, allowable voltage drop and local electrical codes. Cables to the chiller should be of flexible copper cord.
4. Electrical performance data:

Model	Water Cooled Chiller		
	AC400V ±10% /50Hz/3Ph		
	No. of Compressors	RLA (A)	FLA (A)
MTW125	1	133.6	210
MTW150	1	151.5	170
MTW200	1	193.3	206
MTW250	2	273.0	420
MTW300	2	303.3	340
MTW400	2	388.8	412
MTW450	3	454.1	510
MTW550	4	538.3	680
MTW600	4	603.9	680
MTW750	5	755.2	850
MTW800	4	772.5	824
MTW900	6	898.5	1020
MTW1000	5	966.7	1030

RLA: Rated Load Amperage **FLA:** Full Load Ampere

5. These data are based on the same conditions as those for the cooling capacity. See the notes for the Unit General data
6. The sizes of wiring and fuses must be determined according to applicable national and local codes

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/

01/2019 Rev. 1.1