

COOLSIDE DOOR

26 – 39 kW

Air conditioners for IT Cooling for chilled water feeding.



 EC AXIAL

The picture of the unit is indicative and may vary depending on the model

- ON-RACK INSTALLATION
- FOR HIGH DENSITY RACK AND BLADE SERVER
- VARIABLE AIR FLOW AND WATER FLOW
- AXIAL FANS WITH EC ELECTRIC MOTOR

Data Book: T_COOLSIDEDOOR_1118_EN

COOLSIDE DOOR

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MEHITS CERTIFICATIONS

SYSTEM CERTIFICATIONS



ISO 9001 CERTIFICATION – MEHITS S.p.A.
Quality Management System



ISO 14001 CERTIFICATION – MEHITS S.p.A.
Environmental Management System



BS OHSAS 18001 CERTIFICATION – MEHITS S.p.A.
Occupational Health and Safety Management System

PRODUCT CERTIFICATIONS BY COUNTRY



CE MARKING

MEHITS units are in compliance with the European Directives in force.



CCC – CQC CERTIFICATION
(People's Republic of China)



EAC CERTIFICATION
(Russian Federation, Belarus, Kazakhstan)



GENERAL CHARACTERISTICS

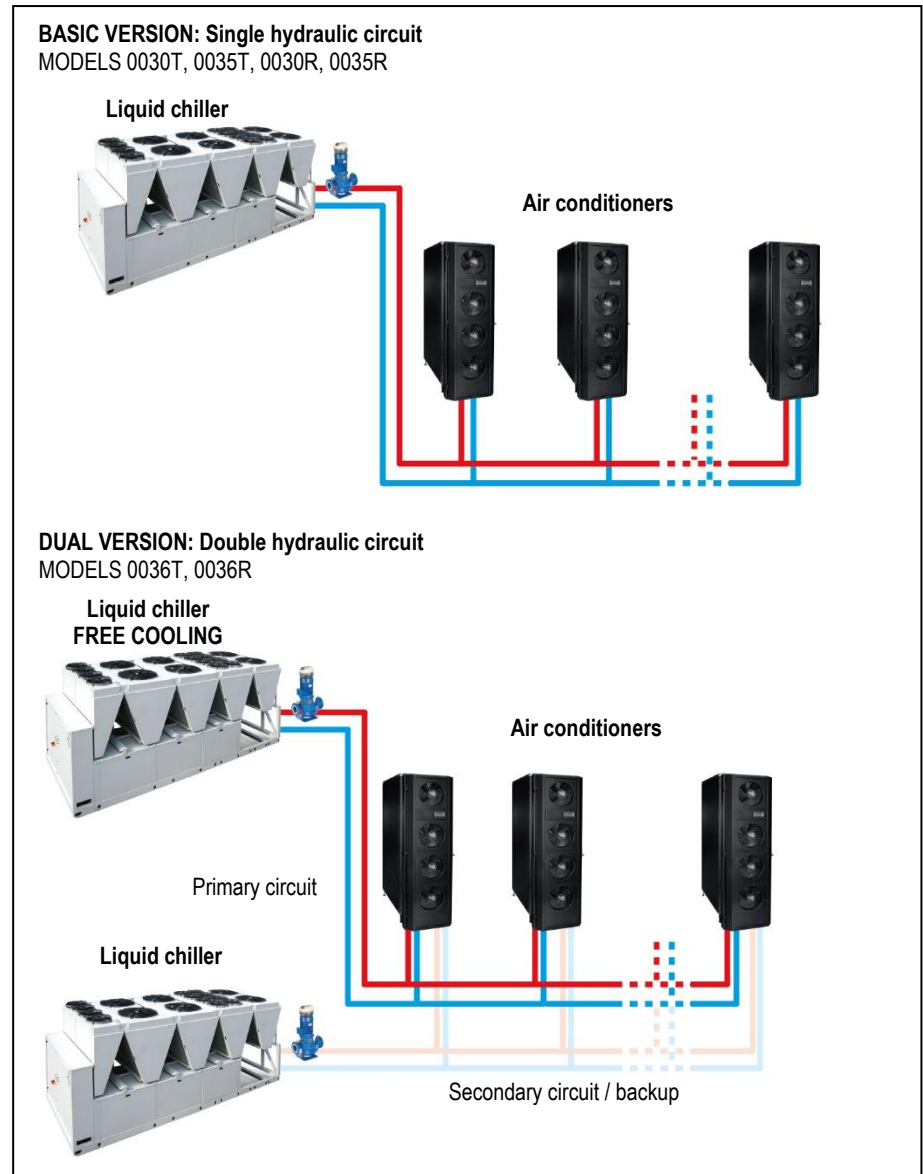


Air Conditioners for IT Cooling for chilled water feeding.

- Axial fans with EC electric motor.
- Single hydraulic circuit, BASIC version.
- Double hydraulic circuit, DUAL version.

This series, for on-rack installation at the rear of the rack, is offered in 6 models available in the following version:

- Frontal air delivery, back side air suction
Cooling capacity: 26 ÷ 39 kW



The machines are made for indoor installation.

The constructive solutions and the internal lay-out allow high application flexibility and the frontal access to the main components for the inspection and routine maintenance.

The installation requires electrical and hydraulic connections.

Final assembly on all machines before shipment including running test, reading and monitoring of operating parameters, alarms simulation and visual check.

COOLSIDE DOOR

INSTALLATION



The series is particularly suitable for installation in Data Center with hot spot for high density racks and blade server exhaust air temperature handling. It is able to cope the high density of the thermal load in a small space, **up to and over 40kW/m² per rack**.

For installation are not required underfloor plenum, ducts or false-ceilings; the installation foresees the direct insertion on the racks to cool. This allows to contrast the localized heat sources (hot spot) tailoring the installation to the actual situation of the plant.

The unit is considered both as a stand-alone cooling unit for the exhaust air on a single rack in small data centers and as a system for managing hot spots in large data centers to supplement existing air-conditioning systems in hot and cold aisles or compartmentation structures. While the racks are cooled by the perimeter air-conditioning unit that provides cold air between 18 and 20°C in the cold aisle, the unit handles racks with the highest thermal load, called HOT SPOTS, generally due to the use of modern BLADE SERVERS.

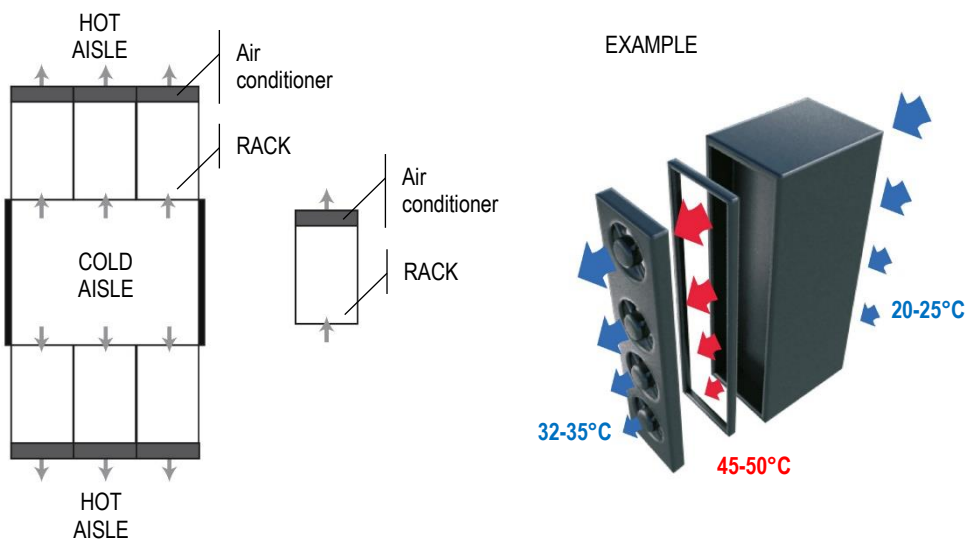
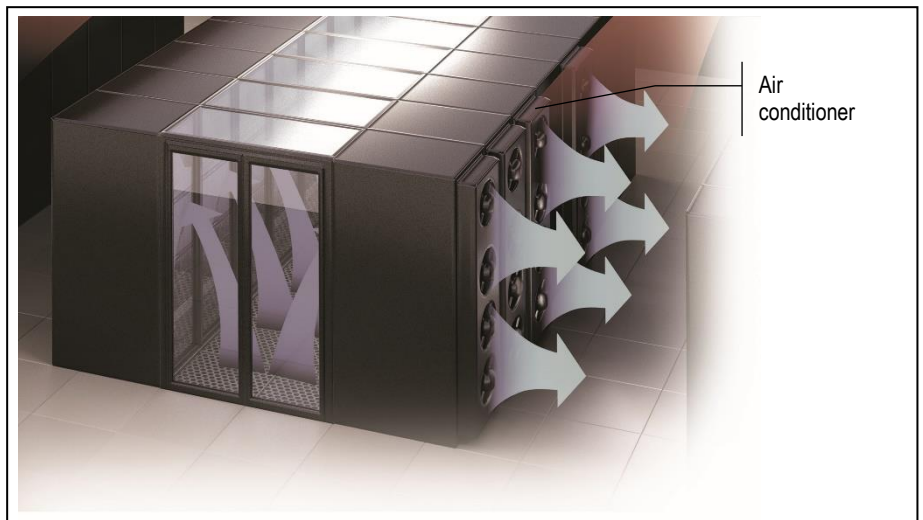
The unit can be supplied installed complete with empty rack series RC RACK (sizes 42U-47U), or alternatively fitted with a frame to adapt to any type of rack installed in the Data Center.

DIRECT COOLING OF THE RACKS

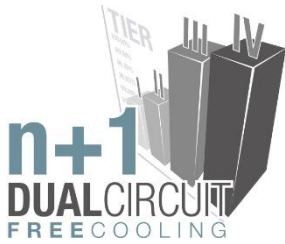
The unit is housed at the rear of the rack and is managed by a DYNAMIC system that SELF-ADAPTS to rack requirements, especially designed to handle rack exhaust air.

PLANT TYPE

Frontal air delivery. Rear air suction.



PRODUCT FEATURES AND BENEFITS



EFFICIENCY

The unit combines the efficiency of a hydronic system for the extraction of heat with the use of last generation EC fans to obtain values of EER more than 100. The reduction of the temperature of the exhausted air allows the use of very high temperature chilled water, between 14-20°C, that if on the one hand prevents unpleasant phenomena of condensation (SHR = 1) on the other hand allows the use of the free cooling system only on chiller for outdoor installation.

FLEXIBILITY

To assure quick and easy installation, the unit is fitted with flexible steel connectors (option) on the water side and the electrical power input at the bottom. This allows the unit to be comfortably opened and closed like a normal door for access to the rack at any time and without any difficulties in wiring, servicing and expanding the servers.

DYNAMIC RACK CONTROL

Optimal control of temperature stratification depending on the load of individual BLADES using 4 independent temperature probes connected to the 4 fans operating in MODULATING and INDEPENDENT modes.

REDUNDANCY

The unit is designed to ensure maximum RELIABILITY of the system by the total REDUNDANCY of the cooling system guaranteed by the version DUAL COIL with dual power supply (optional), dual cooling coil and double regulation valve completely independent to ensure 100 % backup in the air conditioning system. This allows to connect the new DUAL COIL version from one side to the primary FREE COOLING system (Circuit 1) and on the other to a liquid chiller in total Backup.

COMPARTMENTATION AND INTEGRATION

Perfect integration with systems that minimize the mixing of air between the hot and cold aisles and that emphasize the efficiency of such systems. INTEGRATION with all the HYDRONIC products in the MEHITS range via supervision software.

MINIMUM FLOORSPACE OCCUPANCY

The great advantage of the unit lies in the fact that it is installed at the back of the RACK (hot aisle) without occupying space that can be used for the racks, unlike other solutions which, instead reduce the number of racks per row.

FOR EVERY KIND OF RACK

MEHITS can supply the unit complete with rack, series RC RACK, or just the air conditioner for installation in different types of rack using a frame which self-adapts to every kind of racks.

The series represents the state of the art of the air conditioning of Data Center with hot spots for high density racks and blade server cooling. The modularity of the system together with the adaptive logic of microprocessor control, make it the best solution for handling the exhaust air temperature of racks.

- EER up to 190 at nominal conditions.
- High cooling density, **up to and over 40kW/m² per rack.**
- Hydraulic circuit optimization.
- New axial fans with EC electric motors which guarantees a reduction of power consumption;
- New fans electric motor that do not require maintenance;
- R Version with dynamic management of EC Fans, reduces power consumption and maximizes reliability.
- Improvement of the control software with advanced control logic;
- Single and double hydraulic circuit version;
- Total frontal access to facilitate the operations of extraordinary maintenance;

COOLSIDE DOOR

MODEL IDENTIFICATION

Air conditioners for IT Cooling for chilled water feeding
Model: **COOLSIDE DOOR DUAL 0035 R**

COOLSIDE DOOR	Series
BASIC	Version with Single hydraulic circuit
DUAL	Version with Double hydraulic circuit
0035	Model
T	Without fans dynamic control
R	With (N+1) fans dynamic control

WORKING LIMITS

ROOM AIR CONDITIONS

Room air temperature:
16°C / 57% U.R. ÷ 60°C / 7% U.R.

CHILLED WATER TEMPERATURE

10 ÷ 20°C

HYDRAULIC CIRCUIT

16 Bar Maximum working pressure of the hydraulic circuit

POWER SUPPLY

± 10% Maximum tolerance of the supply voltage (V)
± 2% Maximum unbalancing of the phases.

STORING TEMPERATURE

If the machine is not installed on receipt and is stored for a long time, store it in a protected place, at temperatures ranging between -30°C and 50°C in absence of superficial condensation and direct sun light.

MAIN COMPONENTS



FRAMEWORK

- Framework in galvanized steel sheet externally painted with epoxy powders.
- Handle with security lock.
- Frame to adapt to any type of rack.
- Colour RAL 9005.
- Air flow:
 - Air intake from the back side and frontal or side air delivery.

COOLING SECTION

BASIC Version. Single hydraulic circuits for models 0030T, 0035T, 0030R, 0035R

DUAL Version. Double hydraulic circuits for model 0036T, 0036R

Components for each hydraulic circuit:

- Heat exchanger coil with internally corrugated copper tubes and high efficiency aluminium fins, specifically developed to provide high heat transfer and lower pressure drops.
- Finned pack with hydrophilic treatment that assure the condensate water drop, high thermal conductivity and does not favour the growth of micro-organisms.
- 3-way motorized valve for water flow regulation with 3-point control and emergency manual control, supplied in mounting kit.
- Temperature probe on chilled water inlet, supplied in mounting kit.
- Hydraulic connections arranged for connection from bottom side of the unit.
- Condensate tray with flood sensor.
- Air vent valves on the heat exchanger coil.

FANS SECTION

- N.4 axial fans directly coupled to brushless type synchronous EC motor with integrated electronic commutated system and continuous variation of the rotation speed. The motor rotation control is obtained with the EC system (Electronic Commutation) that manage the motor according to the 0÷10V proportional signal coming from the microprocessor control.
- Fans quick installation system for a fast replacement.
- Nr.4 temperature sensors on air delivery.
- Nr.4 temperature sensors on air intake.
- Current detector for loss of air flow alarm.

Only for R version, models 0030R, 0035R, 0036R:

- N+1 dynamic management of EC fans. Allows operation at reduced flow-rate to optimise power consumption. Moreover, in the event of a fault on one fan, the other fans are operated at maximum speed to ensure the same cooling performance.

ELECTRICAL PANEL

Extractable electrical panel in accordance with EN60204-1 norms, complete with:

- Magnetothermic switches for supply fans.
- Terminals for LAN connection.
- Power supply: 230/1/50

CONTROL SYSTEM

- Microprocessor system with graphic display for control and monitor of operating and alarms status. The system includes:
 - Built-in memory for the storing of the intervened events (up to 100 events recorded);
 - Predisposition for connectivity board housing (RS485, LON, Ethernet. The electronic cards are optional accessories;
 - Non-volatile "Flash" memory for data storage in case of power supply faulty;
 - Menu with protection password;
 - LAN connection (max 5 units).

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OPTIONAL ACCESSORIES

The descriptions of these additional components can be found in Chapter OPTIONAL ACCESSORIES.

- 3-way motorized valve kit for water-flow control with 0-10VDC control and emergency manual control;
- Shut-off on/off water valve kit. The on-off valve shuts off water flow into the unit in the event of a flood alarm.
- Water flow meter kit: measures and displays the volume of fluid transiting the unit.
- Network analyser kit: multifunction utility for calculating and displaying the machine electrical measurements.
- Double power supply with automatic change-over kit. Supplied in mounting kit.
- Combined Temperature / Humidity sensor kit on in-room air.

OTHER ACCESSORIES

- Flexible pipes PN10 kit, length 2 meters, for single hydraulic circuit. The optional avoids vibration transmission and allows small movements of the air conditioner.
- Microprocessor control accessories:
 - Serial card MBUS RS485.
 - Serial card LON.
 - Serial card Ethernet

WARNING

The manufacturer reserves the right to accept the matching of the optional installed on the machine.

COOLSIDE DOOR

TECHNICAL DATA – BASIC VERSION – Single Hydraulic Circuit

MODEL		0030R	0030T	0035R	0035T
COOLING CAPACITY (1)					
Total	kW	26,6	31,8	32,2	39,1
Sensible	kW	26,6	31,8	32,2	39,1
SHR (2)		1,00	1,00	1,00	1,00
"EC" SUPPLY FANS					
"EC" SUPPLY FANS	n.	4	4	4	4
Air flow	m ³ /h	5040	6520	4790	6200
Fans power input (3)	kW	0,17	0,30	0,18	0,30
COOLING COIL					
Water flow rate (1)	m ³ /h	3,8	4,6	4,6	5,6
dP coil + valve (1)	kPa	59	80	44	63
POWER SUPPLY	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50
WATER CIRCUIT	n°	1	1	1	1
ENERGY EFFICIENCY INDEX (1)					
EER Energy Efficiency Ratio	kW/kW	156	106	179	130
DIMENSIONS					
Length	mm	600	600	600	600
Width	mm	260	260	260	260
Height	mm	2020	2020	2020	2020
NET WEIGHT	kg	79	79	84	84
HYDRAULIC CONNECTIONS					
WATER INLET / OUTLET	F Ø	1"	1"	1"	1"

THE COOLING CAPACITY DOES NOT CONSIDER THE SUPPLY FAN MOTOR THERMAL LOAD

1. Gross value. Characteristics referred to entering air at 46°C-16%RH with chilled water temperature 14-20°C - 0% glycol. ESP=0Pa.
2. SHR = Sensible cooling capacity / Total cooling capacity.
3. Corresponding to the nominal external static pressure.

COOLSIDE DOOR

TECHNICAL DATA – DUAL VERSION – Double Hydraulic Circuit

MODEL		0036R	0036T
COOLING CAPACITY (1)			
Total	kW	29,1	35,8
Sensible	kW	29,1	35,8
SHR (2)		1,00	1,00
"EC" SUPPLY FANS			
	n.	4	4
Air flow	m ³ /h	4140	5520
Fans power input (3)	kW	0,17	0,30
COOLING COIL			
Water flow rate (1)	m ³ /h	4,2	5,1
dP coil + valve (1)	kPa	42	60
POWER SUPPLY	V/Ph/Hz	230/1/50	230/1/50
WATER CIRCUIT	n°	2	2
ENERGY EFFICIENCY INDEX (1)			
EER Energy Efficiency Ratio	kW/kW	171	119
DIMENSIONS			
Length	mm	600	600
Width	mm	330	330
Height	mm	2020	2020
NET WEIGHT	kg	95	95
HYDRAULIC CONNECTIONS			
WATER INLET / OUTLET	F Ø	1"	1"

THE COOLING CAPACITY DOES NOT CONSIDER THE SUPPLY FAN MOTOR THERMAL LOAD

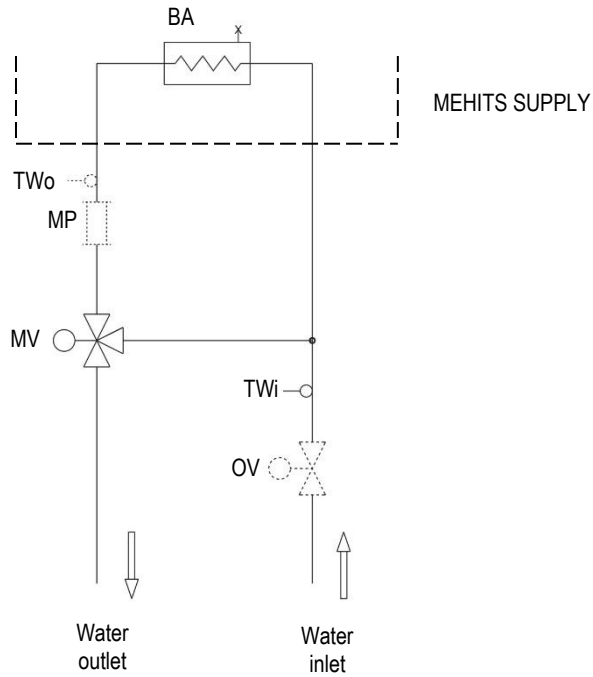
1. Gross value. Characteristics referred to entering air at 46°C-16%RH with chilled water temperature 14-20°C - 0% glycol. ESP=0Pa.
2. SHR = Sensible cooling capacity / Total cooling capacity.
3. Corresponding to the nominal external static pressure.

COOLSIDE DOOR

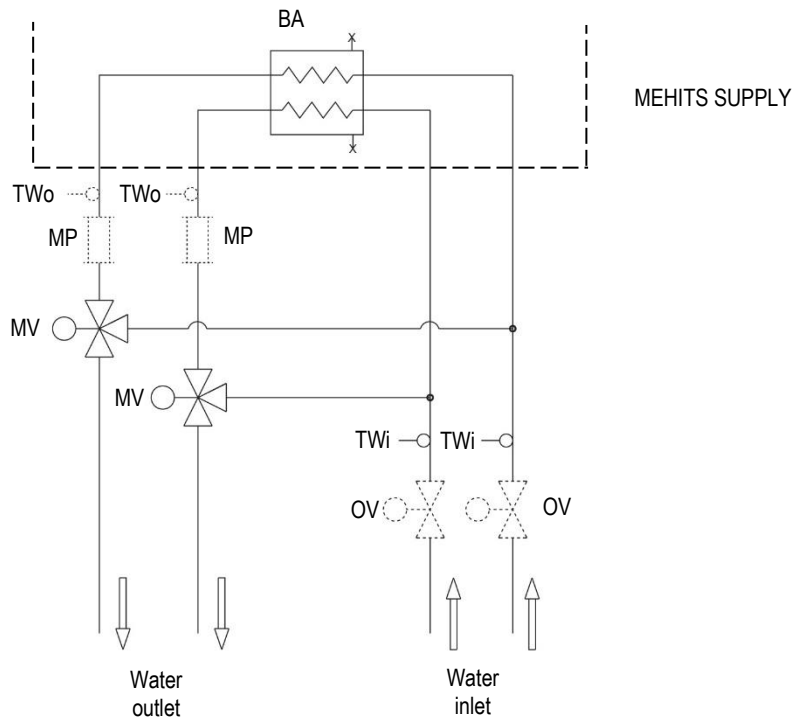
HYDRAULIC CIRCUIT

Below hydraulic diagrams for version with single or double hydraulic circuit. The diagrams refer to the standard configuration, without optional.

SINGLE HYDRAULIC CIRCUIT – BASIC VERSION Models 0030, 0035



DOUBLE HYDRAULIC CIRCUIT – DUAL VERSION Models 0036



LEGENDA

- MV 3-way modulating valve
- OV 2-way on/off valve (optional)
- BA Heat exchanger
- TWi Inlet Water temperature probe
- TWo Outlet Water temperature probe (not supplied)
- MP Water flow meter (optional)

COOLSIDE DOOR

ACOUSTIC DATA

Acoustic data of the standard machine at full load working conditions.

WARNING:

In a closed room the noise produced by a sound source reaches the listener in two different ways:

- Directly
- Reflected from the surrounding walls, floor, ceiling, from furniture.

With the same sound source, the noise produced in a closed room is greater than that produced outdoors. In fact, the sound pressure level generated by the source, must be added to the one reflected from the room. Also, the shape of the room affects the sound.

MODEL		0030R	0030T	0035R	0035T	0036R	0036T
SOUND LEVEL ISO 3744 (1)							
On air delivery	dB(A)	50	55	50	54	51	54

1. Noise pressure level at 1 meter in free field – ISO 3744

ELECTRICAL DATA

MODEL		0030R	0030T	0035R	0035T	0036R	0036T
POWER SUPPLY		230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
STANDARD UNIT							
Max power input (FLI)	kW	0,29	0,30	0,29	0,30	0,29	0,30
Max current input (FLA)	A	2,28	2,28	2,28	2,28	2,28	2,28
Power input (OI)	kW	0,17	0,30	0,18	0,30	0,17	0,30

WARNING:

The electric data indicated refer only to the standard units, without optional accessories.

WATER QUALITY

For a correct and optimal functioning of the hydraulic circuits a water quality must be guaranteed as indicated in the table below. The values shown in the table must be guaranteed during the entire life cycle of the machine.

	Description	Symbol	Range
1	Hydrogen ions	pH	7.5 ÷ 9
2	Presence of calcium (Ca) and magnesium (Mg)	Hardness	4 ÷ 8.5 °D
3	Chlorine ions	Cl ⁻	< 150 ppm
4	Iron ions	Fe ³⁺	< 0.5 ppm
5	Manganese ions	Mn ²⁺	< 0.05 ppm
6	Carbon dioxide	CO ₂	< 10 ppm
7	Hydrogen sulphide	H ₂ S	< 50 ppb
8	Oxygen	O ₂	< 0.1 ppm
9	Chlorine	Cl ₂	< 0.5 ppm
10	Ammonia	NH ₃	< 0.5 ppm
11	Ratio between carbonates and sulphates	HCO ₃ ⁻ /SO ₄ ²⁻	> 1
12	Sulphate ions	SO ₄ ⁻	< 100 ppm
13	Phosphate ions	PO ₄ ³⁻	< 2.0 ppm

where: 1/1.78°D = 1°Fr with 1°Fr = 10 gr CaCO₃ / m³
 ppm = parts for millions
 ppb = part for billion

Explanatory notes:

- ref.1: A greater concentration of hydrogen ions (pH) than 9 implies a high risk of deposits, whereas a lower pH than 7 implies a high risk of corrosion.
- ref.2: The hardness measures the amount of Ca and Mg carbonate dissolved in the water with a temperature lower than 100°C (temporary hardness). A high hardness implies a high risk of deposits.
- ref.3: The concentration of chloride ions with higher values than those indicated causes corrosion.
- ref. 4 - 5 - 8: The presence of iron and manganese ions and oxygen leads to corrosion.
- ref.6 - 7: Carbon dioxide and hydrogen sulphide are impurities that promote corrosion.
- ref.9: Usually in water from the waterworks it is a value of between 0.2 and 0.3 ppm. High values cause corrosion.
- ref.10: The presence of ammonia reinforces the oxidising power of oxygen
- ref.11: Below the value shown in the table, there is a risk of corrosion due to the trigger of galvanic currents between copper and other less noble metals.
- ref.12: The presence of sulphates ions triggers corrosion phenomenon.
- ref.13: The presence of phosphates ions triggers corrosion phenomenon.

It is necessary to carry out periodic checks, with withdrawals at different points of the hydraulic system.

During the first year of operation, checks are recommended every 4 months which can be reduced every 6 months starting from the second year of operation.

WARNING:

It is necessary that, in the presence of dirty and / or aggressive waters, an intermediate heat exchanger is installed upstream of the heat exchangers




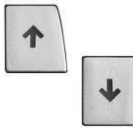

MICROPROCESSOR CONTROL SYSTEM



The microprocessor control system is equipped with 6 keys terminal and back lighted graphic display on which all information in different languages or easily identifiable symbols are displayed.

The system disposes of a "flash" memory that preserves the information even in absence of power supply. Part of memory is dedicated to the registration of intervened events - up to 100 events.

KEYBOARD FUNCTIONS

	ALARM	Alarm, Back - red light active – alarm presence, push to deactivate and have alarm description. If more than one alarm(s) occurred, the others can be scrolled by Key UP / DOWN
	PRG	Menu list, scrolled by key UP/DOWN: Use the ENTER key to execute the mode.
	ESC	Home. Used to come back to the previous menu level or to the main screen.
	UP DOWN	Used to change the pages and values of sets. When display is in main screen (HOME), pressing one of them (UP/DOWN) will display the synoptic of the main controls.
	ENTER	Moving the cursor on adjustable Program(s) fields, press the key to confirm the changes, press the key to get out of the fields.

CONNECTIVITY

Through the optional serial port, the microprocessor control enables communication with the modern buildings BMS systems with the following protocols:

- RS485 serial card;
- LON Works serial card;
- Ethernet serial card;

PASSWORD

Level 1: On request of the End User. Allowing to reach and modify USER parameters.

Level 2: Asks to Service: Allowing to reach and modify MAINTENANCE parameters.

Level 3: Asks to Service: Allowing to reach and modify MANUFACTURER parameters.

LAN NETWORK

The LAN is part of the control software and it is possible to connect 5 units.

This type of connection allows to control the units in coherent way, moreover the units can be controlled and managed from a shared remote terminal.

LAN ADDRESS LIST

Unit #	1	2	3	4	5	Remote Terminal
Terminal address	26	27	28	29	30	32
Mother board address	21	22	23	24	25	-

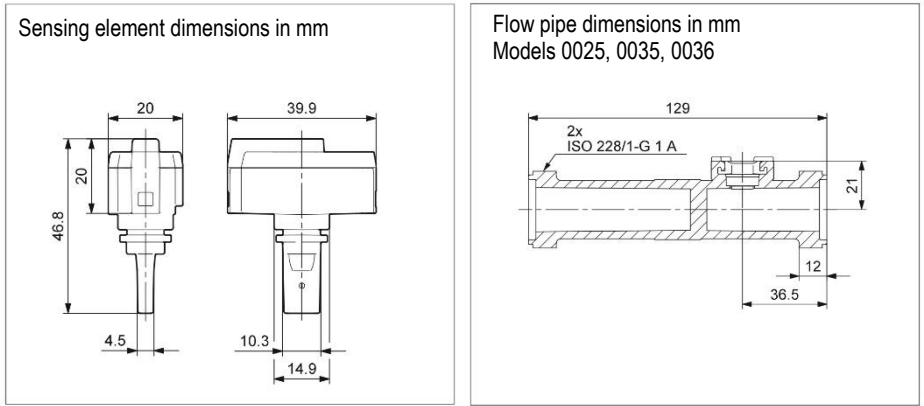
OPTIONAL ACCESSORIES – WATER FLOW METER



The optional accessory is supplied in mounting kit.

The flow meter directly measures and displays the volume of fluid transiting the unit, simplifying unit configuration during commissioning, as well as displaying the cooling capacity delivered if combined with the modulating water valve kit.

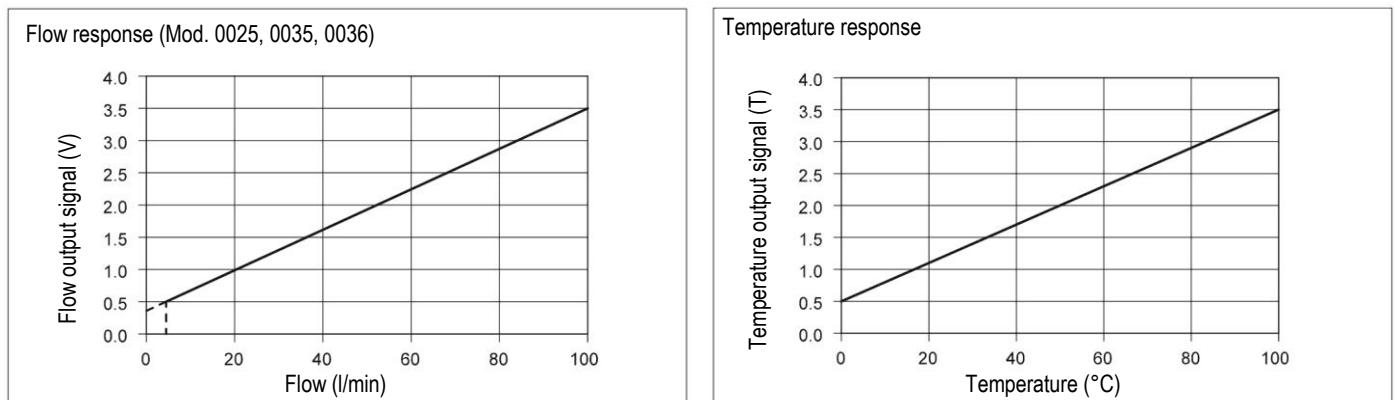
The vortex flow meter exploits the sequence of vortices produced by the fluid that comes into contact perpendicularly with a bluff body. The frequency of such vortices is proportional to the flow rate of the fluid. A special detector converts this frequency into an electrical signal for determining the fluid flow-rate.



TECHNICAL DATA

Flow	Mod. 0025, 0035, 0036
Measuring range	5 to 100 l/min
Accuracy ($\pm 1\sigma$), 0 to 100°C	$\pm 1.5\%$ FS
Resolution	0.5 l/min
Temperature	
Measuring range	0 to 100 °C
Accuracy ($\pm 1\sigma$), 25 to 80°C	± 1 °C
Accuracy ($\pm 1\sigma$), 0 to 100°C	± 2 °C
Resolution	0.5 °C
Media and environment	
Media types	The sensor is compatible with liquids (kinematic viscosity ≤ 2 mm ² /s)
Media temperature (operation)	0 to 100°C
Media temperature (peak)	-25 to 120°C, non-freezing
Ambient air temp. (operation)	-25 to 60°C
Ambient air temp. (peak)	-55 to 90°C
Humidity	0 – 95% (relative), non-condensing
System burst pressure	> 16 bar

Sensor output signals



COOLSIDE DOOR

OPTIONAL ACCESSORIES – 3-WAY MOTORIZED VALVE FOR WATER FLOW REGULATION



The optional accessory is supplied in mounting kit.
3-way motorized valve with 0-10V control actuator for water flow regulation in the finned coil.

The rotative actuator is controlled by a signal from the microprocessor controller. The actuator is equipped with an emergency button for manual operation and is maintenance-free.

OPTIONAL ACCESSORIES – 2-WAY ON/OFF VALVE



The optional accessory is supplied in mounting kit.
The on-off valve shuts off water flow into the unit in the event of a flood alarm.

Components:

- Valve body
- 24 VAC electric servo control with limit switch
- Nr.2 x 3-piece joint

OPTIONAL ACCESSORIES – COMBINED TEMPERATURE/HUMIDITY SENSOR KIT ON IN-ROOM AIR.



The optional accessory is supplied in mounting kit, to install within the unit or near the air intake to the rack.

The temperature/humidity probe is required in order to use the IDM (Integrated Dynamic Management) function. This measures the dew point of the intake air to the unit and activates a special alarm signal if the water temperature is below dew point and consequently there is the risk of dehumidification and condensate forming.

Components:

- Temperature / humidity probe
- Cable with male connector

OPTIONAL ACCESSORIES – NETWORK ANALYZER



The optional is supplied in mounting kit, to install downstream the main switch, it includes:

- Network transducer;
- Current transformers, one for each power supply phase cable.

This device provides continuous measurement of power consumption, monitoring current, voltage and power. These values are sent to unit microprocessor via RS485 serial cable, as shown on the unit wiring diagram.

The displayed variables are:

- Phase to phase voltage, only for three-phase units;
- Phase voltage (phase-neutral);
- Phase current;
- Neutral current only for three-phase units;
- Active phase power, only for three-phase units;
- Total active power;
- Active energy;
- Hour counts

OPTIONAL ACCESSORIES – DOUBLE POWER SUPPLY WITH AUTOMATIC TRANSFER SWITCH



The optional accessory is supplied in mounting kit.

The motorised changeover switches automatically manage changeover under load between two mono-phase or three-phase power supplies, or manually for emergency operations.

These transfer switching (TSE) devices are suitable for low voltage systems with interruption of the supply to the load during transfer.

The model supplied in the automatic version checks the source and switches over automatically, based on configurable parameters.

OPEN TRANSITION TYPE TRANSFER SWITCH WITH A MINIMUM INTERRUPTION OF THE SUPPLY DURING TRANSFER.

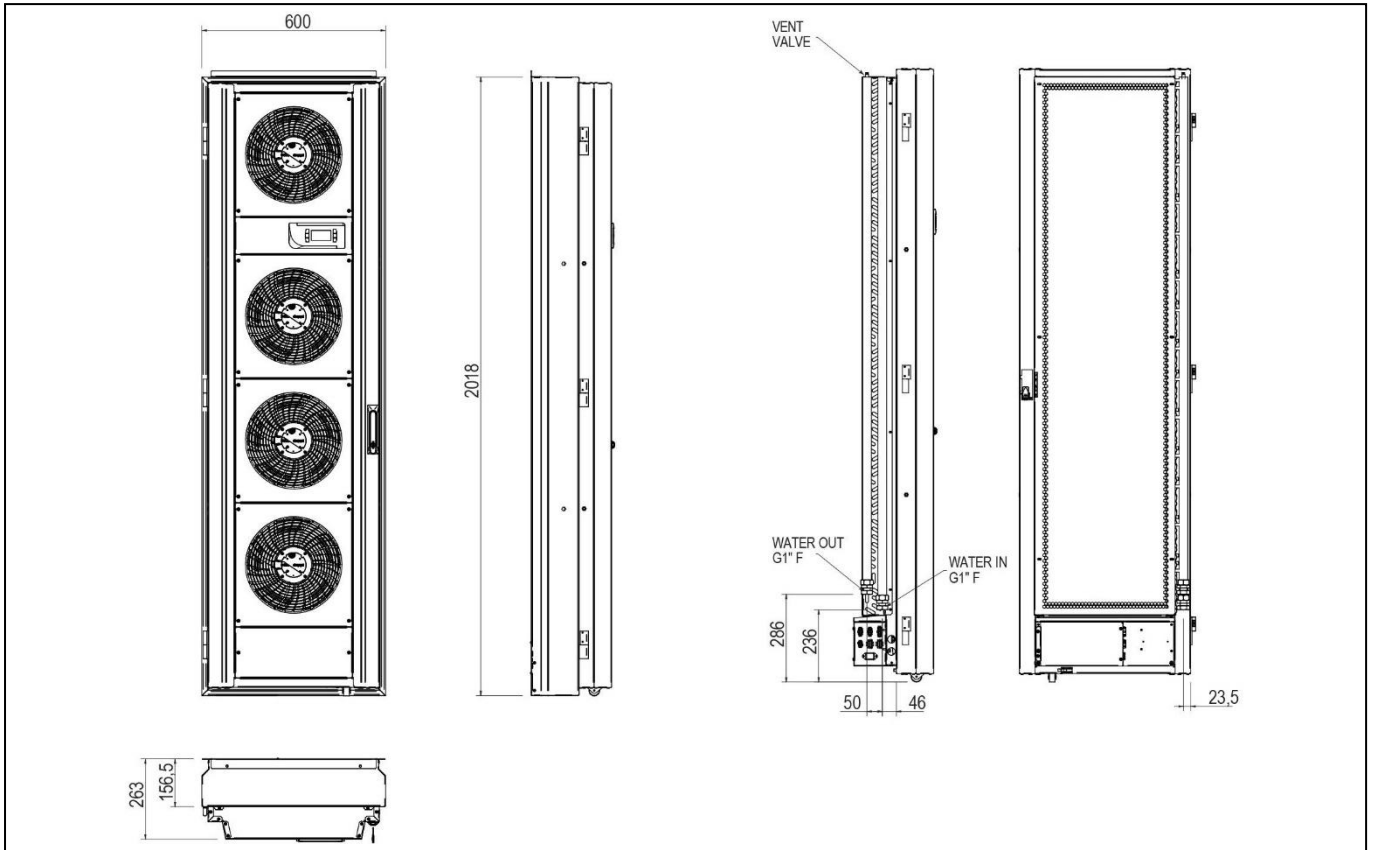
ATS INSTALLATION

Frame	Power Supply	ATS Installation
0025	230/1/50	EXTERNAL, supplied in kit
0035	230/1/50	EXTERNAL, supplied in kit
0036	230/1/50	EXTERNAL, supplied in kit

COOLSIDE DOOR

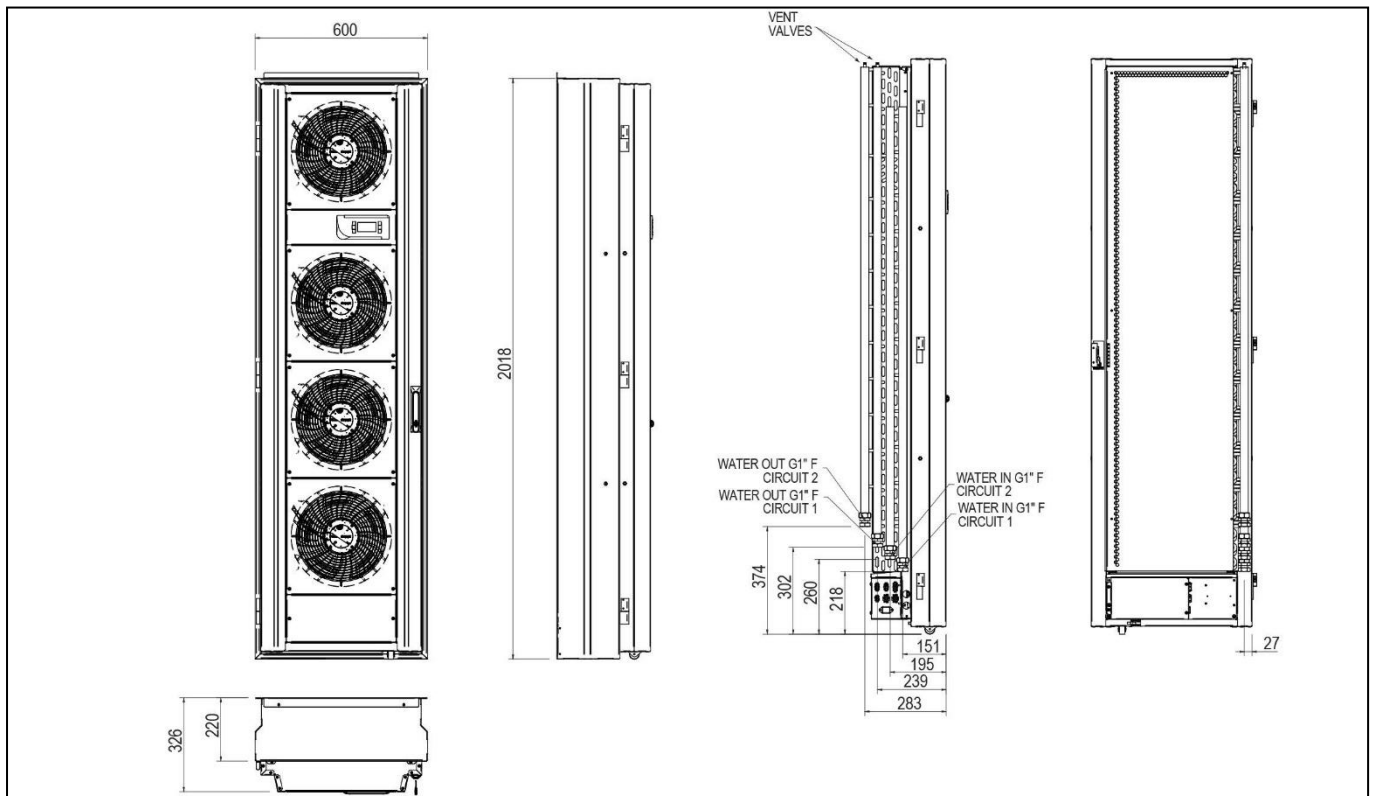
MACHINE DRAWINGS

Dimensions in mm – Models 0030 - 0035



MACHINE DRAWINGS

Dimensions in mm – Model 0036





for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.



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