



Liebert[®] PCW PW400 Cyrus One

User Manual

English, 10032256MAN_ENG, rev. B - 27.05.2022

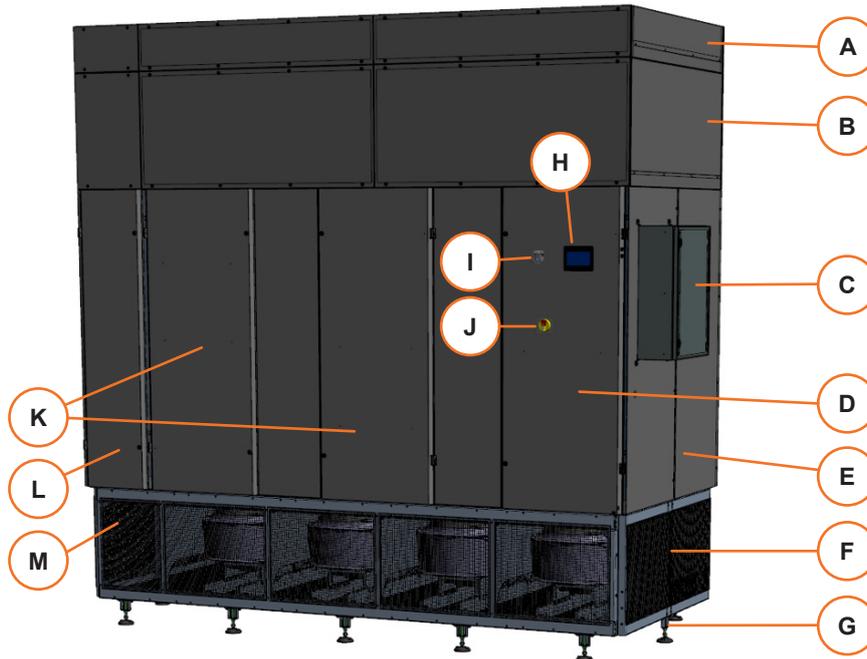
This document, written in English, is the original version

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1. Unit Description

1.1. Unit structure



Ref.	Description	Remarks
A	Plenum with damper	Plenum for return air intake is attached on top of the unit. This plenum is equipped with dampers and can be connected to the air duct.
B	Plenum with filters	Plenum with filter assembly is attached on top of the coil section.
C	ATS box	External box for ATS module.
D	Door with control display	Frontal panels are attached on hinges. These door allow access to the electric panel inside the unit. Proper tool is required to unlock the latches and open the door. It is necessary to turn OFF the unit to be able to open this door.
E	Coil section	The coil section makes up the main body of the unit. This section is fully enclosed by panels and door for protection against any contact with electric components or hot and cold surfaces.
F	Fan section	The fan section is located underneath the coil section. It is completely enclosed by panels or safety grids to prevent any contact with the moving parts.
G	Base legs	The unit can be equipped with base legs. Purpose of these legs is to raise the unit if necessary. It is also possible to compensate any uneven surface.
H	Control panel/display	The unit is usually controlled remotely by network connection. 7" touch screen control panel is located on the front door for direct control of the unit.
I	Mode selector switch	3-position switch to select working mode of the unit is located next to the control panel.
J	Shut-OFF switch	The shut-OFF switch is located on the front door. It prevents opening of the door while the unit is ON .
K	Door	Frontal panels are attached on hinges. These door allow access to the coil inside of the cabinet.
L	CW access door	This frontal panel is attached on hinges. Proper tool is required to unlock the latches and open the door. This door allows access to the chilled water valves and pipes.
M	Chilled water connection	Connections for inlet and outlet of the chilled water (from external source) are located in the fan module. The unit is prepared for bottom connection of pipes. The pipes are equipped with grooved connections.

1.2. Internal components



Ref.	Description	Remarks
N	Filter assembly	The intake plenum on top of the unit is equipped with filters. The plenum allows for easy access, maintenance and replacement of the filters.
O	Electric panel	For details regarding the electric panel, see chapter <i>2.8 Electric and control system</i> .
P	Blocker panel	This panel is located underneath the electric panel. Its purpose is to enclose the internal space of the unit even if the frontal door is opened.
R	Fan section	The fan section of this unit consists of 8 fans arranged in 2 rows. Fans can be easily removed for maintenance or replacement.
S	Coil/heat exchanger	The unit is equipped with two chilled water coils arranged in "A" shape. One coil can be accessed from the front, the other coil is accessible from the back side of the unit.
T	CW pipe and valve assembly	The unit can be equipped either with 2-way valves or PIC valves. Pipe assembly with valves for both coils is located on the left side of the unit.

1.3. Dimensions and weights

1.3.1. Overall dimensions

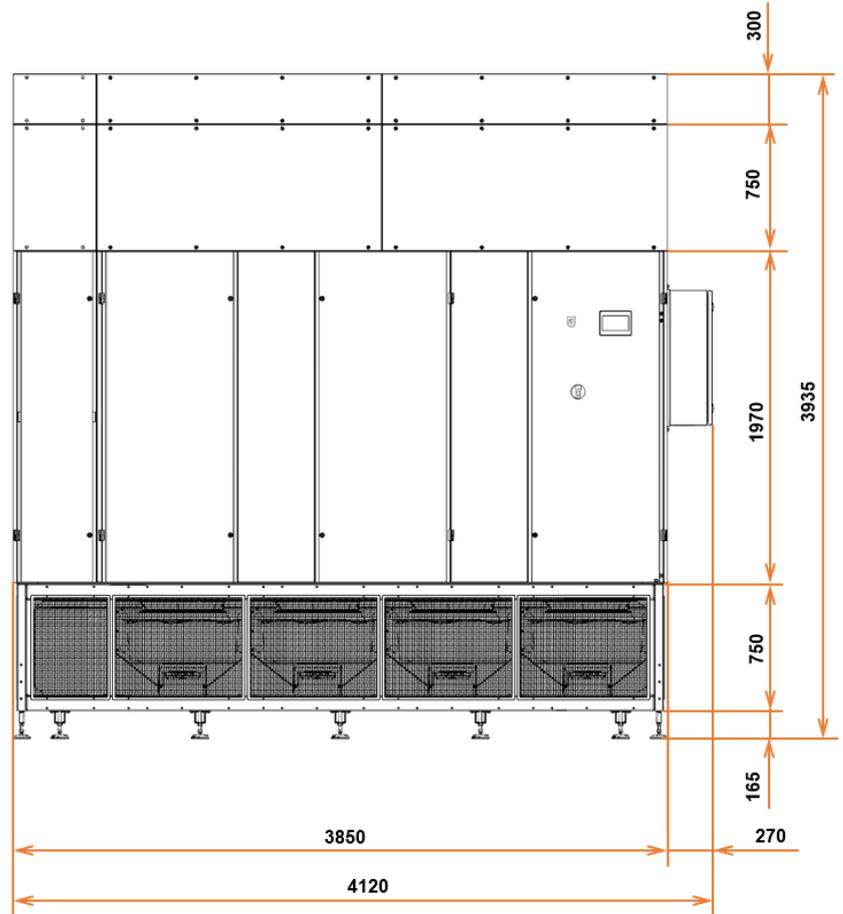
Dimensions	
Overall length *	4120 mm
Depth	1750 mm
Overall height **	3935 mm

* The overall length consists of:

Unit	3850 mm
External ATS box	270 mm

** The overall height consists of:

Damper plenum	300 mm
Filter section	750 mm
Coil section	1970 mm
Fan module	750 mm
Base leg kit	165 mm



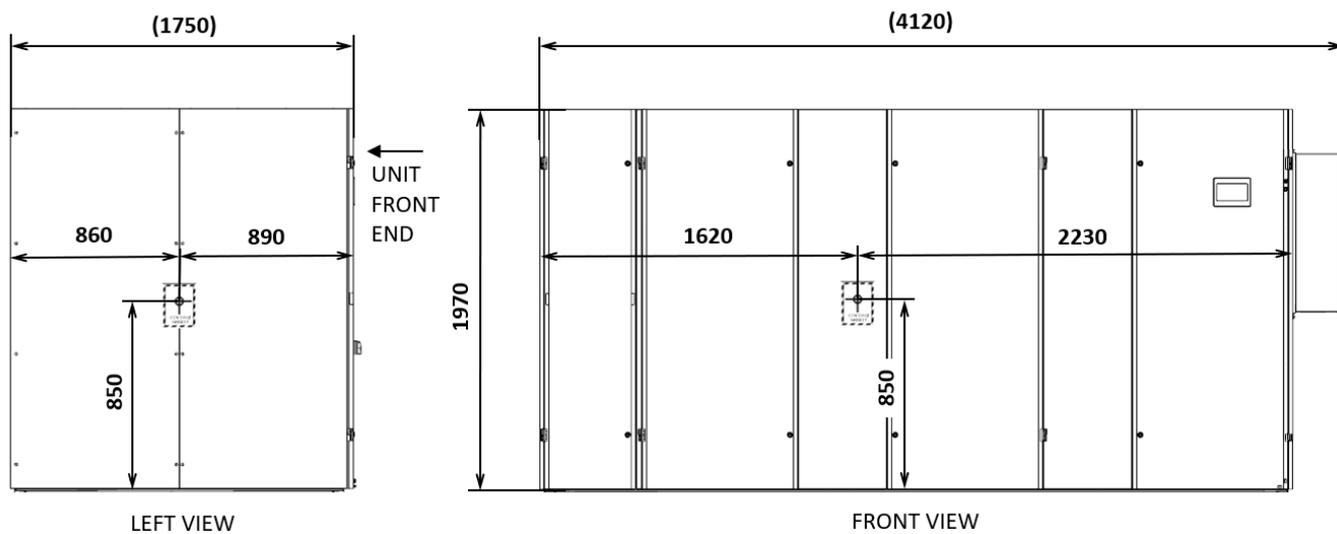
1.3.2. Weights

PW400 unit weights	
Plenum with damper	260 kg
Filter section	650 kg
Coil section	1240 kg
Fan module	650 kg
Total unit weight	2800 kg

NOTE:

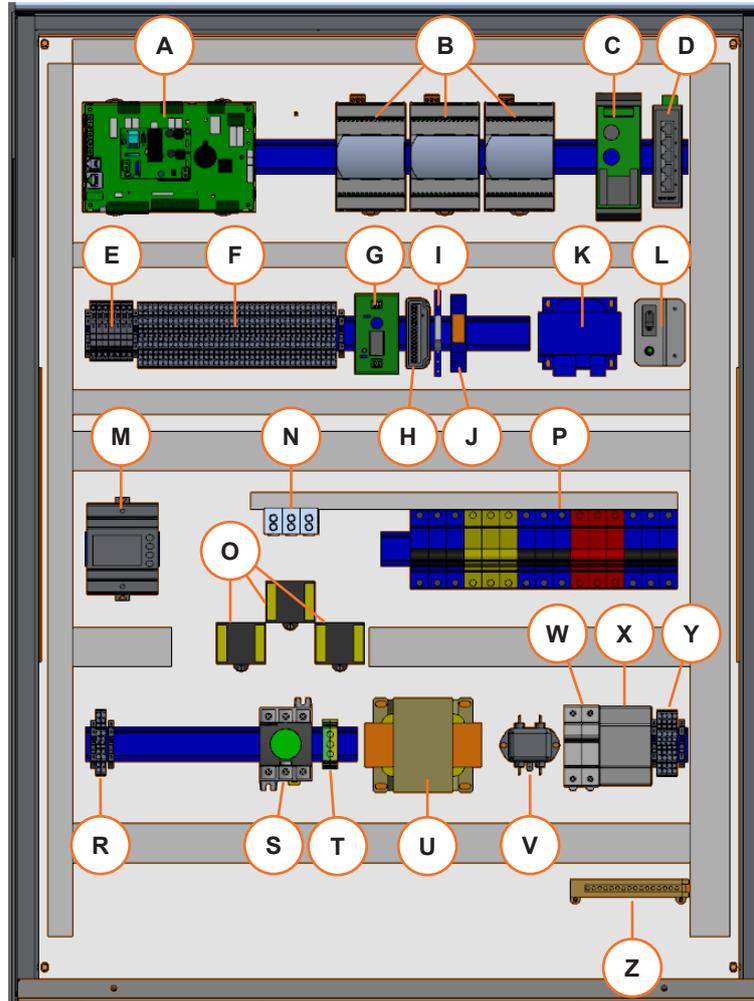
- The plenum with filters, coil section and fan module are delivered separately and need to be connected at the installation site.
- Optional intake plenum with dampers is also delivered separately and needs to be attached on site.
- Optional base legs are delivered separately, disassembled, and need to be attached to the fan module, on site, before assembling the unit.

1.3.3. Center of gravity



2. Electric panel

2.1. Main components



Control side (low voltage)		Power side (high voltage)	
A	Control board	K	Transformer
B	Ultracap (3x)	M	Energy meter
C	Feeder for touch screen	N	Distribution power bus bars
D	Ethernet switch  NOTE: The electric panel is designed and manufactured according to EN 60204-1. It is recommended to use 90 degrees LAN connector for HUB/Ethernet switch.	O	Current transformers
E	Fuses terminal board	P	Thermal magnetic circuit breakers
F	Terminal board	S	Disconnecting switch
G	Feeder for ethernet switch	T	PE terminal block
H	Damper control relay	U	Transformer
I	ON/OFF relay	V	Energy meter power supply filter
J	Flooding alarm relay	W	Energy meter power supply fuses
L	ON/OFF switch with led indicator  WARNING This is not a disconnecting switch. See 2.2. Disconnecting switches	X	Energy meter fuses for voltage inputs
R	Fan Modbus terminal board	Y	Power terminal blocks
		Z	Ground terminal blocks

2.2. Disconnecting switches



WARNING

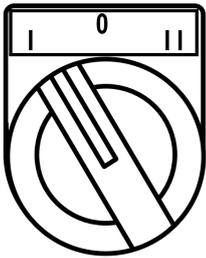
Due to the presence of Ultracaps for the control and other devices, the electric and control panels can retain a stored high-voltage electrical charge for a certain time.

Before removing the panels and working inside the electric and control panels proceed as follows:

- Open all the local and remote disconnecting switches of the unit.
- Wait at least **5** minutes.
- Verify with a voltmeter that the power is **OFF**.

2.3. 3-position switch

The 3-position switch is located on the front door, next to the control display.



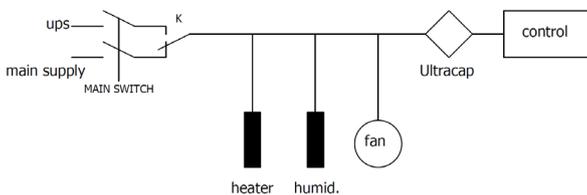
0	OFF mode
	• Unit is switched OFF .
I	Manual mode
	• Fan speed is forced to MAX value and CW valve is fully open.
II	Automatic mode
	• Fan speed is driven according to temperature within CAC. CW valve controls supply air temperature respecting above mentioned software logic.

NOTE: For more information regarding electrical components of the unit, see the original PW400 User manual (10028556).

2.4. Electric and control system

The unit is delivered with dual power supply to have the units up and running if the main power supply fails.

2.4.1. Dual power supply – Alternate



Double power supply to the ATS electric panel, which is connected to the main electric panel.

Each power supply can supply completely the unit.

What happens in case of power outage:

- In case of failure of the main supply, the ATS automatically switches to the second power supply.
- If the Ultracap avoids power interruption to the control for the time needed for the switching, then the unit restarts with a “fast startup”, which means it restarts from the status before the power failure.
- Otherwise the unit restarts automatically from scratch and the control system reboots.

NOTE: The Ultracap supplies power to the control for about **3** minutes.

NOTE: Depending on the electric system configuration, the unit may be set to remain switched off for a certain time.

What happens when power is restored:

The ATS remains on the second power supply until the main power supply is restored.

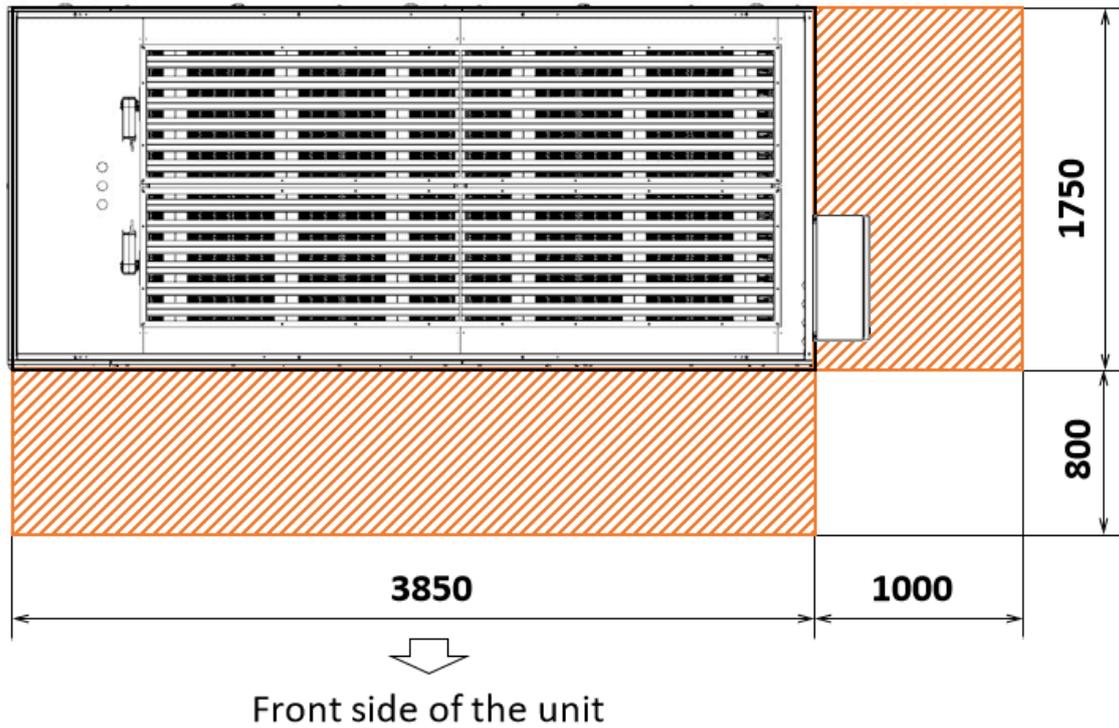
2.5. Space requirements

- See chapters 1.3.1. for dimensions and 1.3.2. for weights of the unit
- Keep a free space between the unit and any obstacle as shown in the figure.

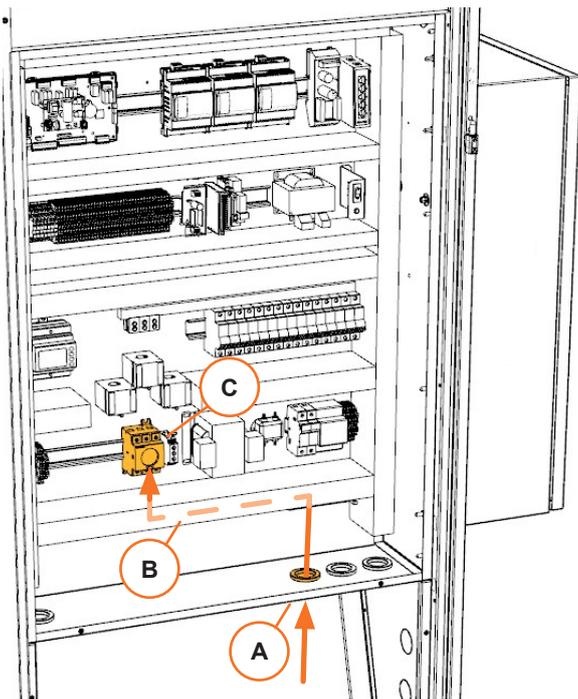


WARNING

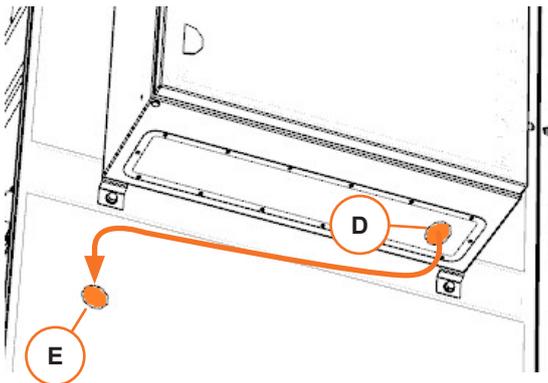
Leave a free space of at least **0,8 m** on the **front** of the unit to allow safe installation and maintenance operations.
 Leave free space at least **1 m** to the **right side** of the unit to allow safe access to the external ATS module.



2.6. Power supply connection



- Turn the main switch handle on the front panel to **0/OFF**
- Open the front door to get access to the electrical panel.
- Remove the safety panel underneath the electric panel.
- Run the power cable **[A]** from the bottom through the highlighted precut in the bottom of the electric panel. Use appropriate cable ties to fix the cable to the frame on the left shoulder.
- Put the power cable into the cable gutter **[B]**.
- Connect the power cable to the inlet terminals **[C]**.



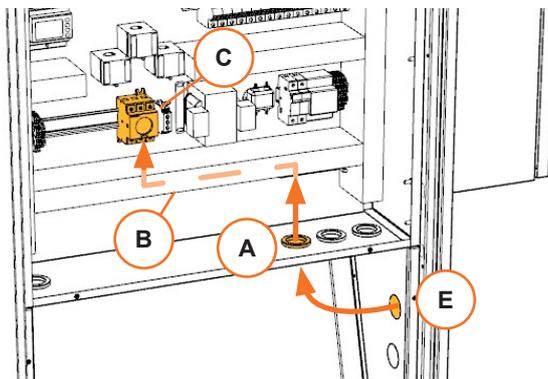
To connect the external ATS module:

- Run the cable through the precut in the bottom of the external box **[D]** and through the precut in the side panel of the unit **[E]**.



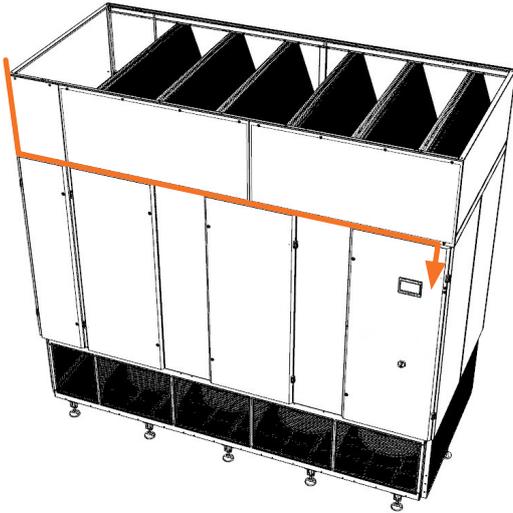
NOTICE

Make sure not to damage the electrical cable between the panels and the unit.



- Run the power cable **[A]** from the bottom through the highlighted precut in the bottom of the electric panel. Use appropriate cable ties to fix the cable to the frame on the left shoulder.
- Put the power cable into the cable gutter **[B]**.
- Connect the power cable to the inlet terminals **[C]**.
- Re-attach the safety panel underneath the electric panel.

2.7. Contacts for the unit status signals



- Turn the main switch handle on the front panel to 0/OFF
- Open the front door to get access to the electrical panel.
- Remove the front panels on the filter section.
- Run the signal cable around the filter module, into the electric box inside the coil section.
- The same cable routing may be used also for additional remote sensors and optional Modbus probe for supply/return air temperature.
- For details about the cable entrance holes see *Annex C – Connections* in the *PW400 User manual (10028556)*
- Use appropriate cable ties to fix the cable to the frame in the filter module.
- Restore the original protection degree with suitable accessories for the wiring and junction boxes.

remote on - off (CLOSE = ON)	—	394	395
clogged filter (CF) (CLOSE = OK)	—	GND	35
GENERAL ALARM	—	C8	NO9
WARNING	—	C8	NO8
User input no. 1 (CLOSE = OK)	—	30	GND
condensate pump (CLOSE = OK)	—	31	GND
User input no.4 IR/Ultrasonic/Fire alarm	—	83	GND
Configurable input no. 5 / water leak. alarm	—	B2	GND
FLOODING ALARM	—	C1	NO1 NC1

The dry contacts can be used only with PELV type sources, as described by the norm EN 60204-1 “Safety of machinery - Electrical equipment of machines”.

The table on the left shows the available terminals and their meaning (refer to the Electric diagrams for details).

The cable must be protected by a sheath.

NOTE:

- *The fans alarms are managed through Modbus.*
- *The ID contacts are on the control board*

3. Operation

3.1 Safety Instructions



WARNING

Improper operations can cause injury or death.



NOTICE

Improper operations can cause product damage.



Read carefully the chapter *1. Safety*.

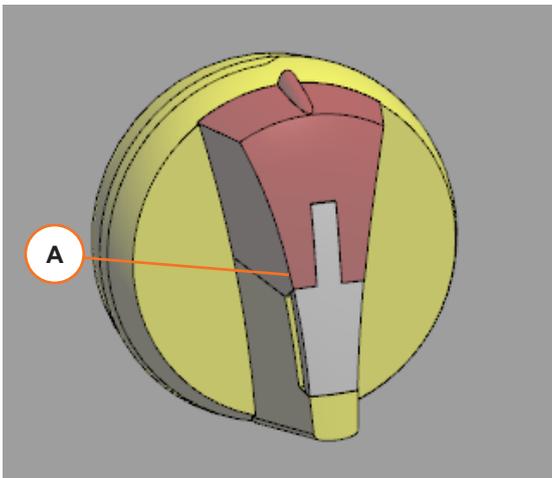
Pay attention to the safety labels on the unit and to the safety warnings in this chapter.



NOTICE

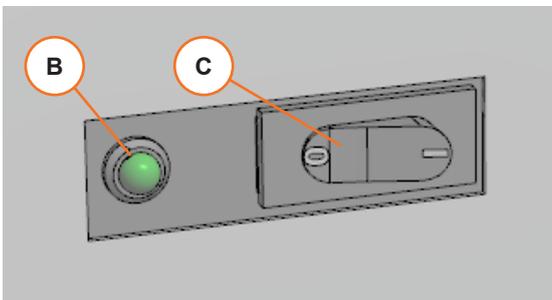
The power supply should never be disconnected during normal operation, except when performing maintenance.

3.2 Power-up



1. Close the disconnection device upstream the unit (to be installed by the customer).
2. Turn the 3-position switch to position **0/OFF**
3. Turn the disconnecting switch **[A]** to position **I/ON**
 - If the display is present, then check that it turns **ON**.
 - In case of first startup or after maintenance on the electric system, check again by a voltmeter or tester if the voltage and phase difference fall within the indicated limits.

3.3. Start



- Turn the disconnecting switch **[A]** to position **0/OFF**
- Open the door

Set ON/OFF switch **[C]** for controls to **I/ON**.

The LED **[B]** lights up, showing the presence of the electric power.

See the *PDX-PCW Control Application* for details.

If the LED does not light up, see *chapter 9. Troubleshooting*

- Close the door
- Turn the disconnecting switch **[A]** to position **I/ON**
- Put the 3-position switch in position **II/Automatic mode**
- Adjust the setpoint as indicated in the *PDX-PCW Control Application*.



CAUTION

The fan starts immediately (the fan always works when the unit is **ON**).

3.4. Check the operation



NOTICE

The following checks must be done:

- at first startup
- in case of restart after a long stop
- at time intervals during the normal operation

Alarms

- Make sure that all the alarms due to protective devices interventions have been reset (see *PDX-PCW Control Application*)

Control and safety devices

- Check the correct operation of the control and safety devices.

3.5. Stop

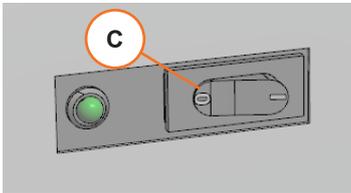


In case of a long stop (seasonal shutdown):

- Turn the 3-position switch to position **0/OFF**
- Set the ATS disconnecting switch **[B]** to the position “0”
- Close the disconnection device upstream the unit.
- If the unit is not equipped with ATS, turn the disconnecting switch **[A]** to position **0/OFF**

3.6. Restart

After a short stop



The unit is still powered

- Set the ON/OFF switch **[C]** to **I/ON**
- Put the 3-position switch **[B]** in position **II/Automatic mode**

After a long stop

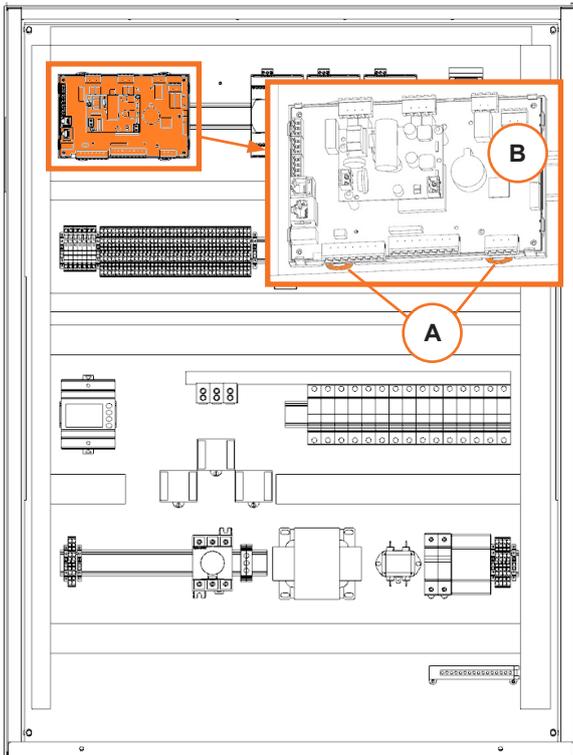
- Do the complete procedure as described in chapters *7.2 Power-up* and *7.3 Start*

In case of power blackout

- See chapter *2.9.1. Dual power supply – Alternate* in the original *PW400 User manual (10028556)*

4. Component replacement

4.1. Replacing the control board



WARNING

Disconnect the unit from power supply

How to remove

- Remove the cover plate of electrical and control panel.
- Remove all the cables connected to the control board.
- Insert a screwdriver in one of the loops [A] and lever/pull the latch to release the lock [B].
- Repeat for the other latches until the control board can be removed from the rail.

How to reassemble

- Press the control board in the DIN rail until it locks.
- Connect the cables.
- Reassemble the cover plate of electrical and control panel.
- Connect the unit to the power supply.
- Upload the software from the computer (or USB drive) to the control board.
- Restart the unit.

NOTE:

Battery type - Lithium button (removable), BR2032, 3Vdc. Duration min. 8 years in normal operating conditions.

NOTE:

For more information regarding maintenance and replacing other components, see the original PW400 User manual (10028556).

Annex D - ATS (Automatic Transfer Switch)

Please, see the entire chapter *Annex D – ATS (Automatic Transfer Switch)* in the original *PW400 User manual (10028556)*. This unit can be equipped with 125A ATS module, while the standard unit contains 63A ATS module.

Technical data

Ratings		125 A
Type		Type 03
Frequencies		50 – 60 Hz
Thermal current I_{th} at 40°C		125
Short-circuit capacity	Rated short-term withstand current: I_{CW} 1s [KA_{eff}]	4
	Rated short-term withstand current: I_{CW} 30ms [KA_{eff}]	10
Switching time at I_n excluding loss of supply sensing time and excluding any delay timers applicable	I – II or II – [ms]	180
	Duration of “Electrical Blackout” at U_n [ms]	90
	I – O, O – I, II – O, O – II [ms]	45
Connection cross-section	Minimum size [Cu mm ²] flexible and rigid	10
	Maximum size [Cu mm ²] flexible and rigid	70

NOTE Maximum altitude without de-rating: 2000 meters. Maximum air temperature without de-rating: 40°C.

Annex E – Ethernet switch with TURBO RING function

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1. Description

The EDS-405A ethernet switch is designed especially for industrial applications.

The switches support a variety of useful management functions, such as:

- Turbo Ring,
- Turbo Chain,
- Ring coupling,
- IGMP snooping,
- IEEE 802.1Q VLAN,
- Port-based VLAN,
- QoS,
- RMON,
- Bandwidth management,
- Port mirroring, and warning by email or relay.

The ready-to-use Turbo Ring can be set up easily using the web-based management interface, or with the DIP switches located on the top panel of the EDS-405A switches. The device include 5-port smart Ethernet switches and the built-in smart alarm functions helps system maintainers monitors to health on the Ethernet network.

2. Specifications

- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and RSTP/STP for network redundancy;
- IGMP Snooping, QoS, IEEE 802.1Q VLAN, and port-based VLAN supported;
- Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01;
- Supports MXstudio for easy, visualized industrial network management;
- DHCP Option 82 for IP address assignment with different policies;
- Supports EtherNet/IP and Modbus TCP protocols for device management and monitoring;
- Port mirroring for online debugging;
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning;
- QoS (IEEE 802.1p and TOS/DiffServ) to increase determinism;
- RMON for proactive and efficient network monitoring;
- SNMPv1/v2c/v3 for different levels of network management security;
- Bandwidth management to prevent unpredictable network status;

Ethernet interface	
10/100BaseT(X) Ports (RJ45 connector):	EDS-405A
Standards:	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100BaseFX IEEE 802.3x for flow control IEEE 802.1D-2004 for Spanning Tree Protocol IEEE 802.1p for Class of Service IEEE 802.1Q for VLAN Tagging IEEE 802.1w for Rapid Spanning Tree Protocol
Ethernet software features	
Filter:	802.1Q VLAN, GMRP, GVRP, IGMP v1/v2, Port-based VLAN
Industrial Protocols:	EtherNet/IP, Modbus TCP
Management:	Back Pressure Flow Control, BOOTP, DHCP Option 66/67/82, DHCP Server/Client, Flow control, IPv4/IPv6, LLDP, Port Mirror, RARP, RMON, SMTP, SNMP Inform, SNMPv1/v2c/v3, Syslog, Telnet, TFTP
MIB:	Bridge MIB, Ethernet-like MIB, MIB-II, P-BRIDGE MIB, RMON MIB, Groups 1, 2, 3, 9, RSTP MIB
Redundancy Protocols:	RSTP, STP, Turbo Chain, Turbo Ring v1/v2
Time Management:	NTP Server/Client, SNTP
Switch properties	
IGMP Groups:	256
MAC Table Size EDS-405A:	2 K
Max. No. of VLANs:	64
Packet Buffer Size:	1 Mbits
Priority Queues:	4
VLAN ID Range: VID 1 to 4094	VID 1 to 4094
Serial interface	
Console Port:	RS-232 (TxD, RxD, GND), 10-pin RJ45 (115200, n, 8, 1)
DIP Switch configuration	
Ethernet Interface:	Turbo Ring, Master, Coupler, Reserve
Input / Output interface	
Alarm Contact Channels:	Relay output with current carrying capacity of 1 A @ 24 VDC
Power parameters	
Input Voltage:	12/24/48 VDC, Redundant dual inputs
Input Current EDS-405A:	0.286 A @ 24 VDC
Inrush Current EDS-405A:	2.08 A @ 24 VDC (0.1 – 1ms)
Overload Current Protection:	Supported
Reverse Polarity Protection:	Supported
Connection:	1 removable 6-contact terminal block(s)
Physical characteristics	
Housing:	Metal
IP Rating:	IP30
Dimensions:	53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
Weight:	EDS-405A 650 g (1.44 lb)
Installation:	DIN-rail mounting
Environmental limits	
Operating Temperature Standard Models:	-10° to 60°C (14° to 140°F)
Storage Temperature (package included):	-40° to 85°C (-40° to 185°F)
Ambient Relative Humidity:	5 to 95% (non-condensing)

Standards and certifications	
Safety All models:	UL 508
Non-PTP models:	UL 60950-1
EMC:	EN 55032/24
EMI:	CISPR 32, FCC Part 15B Class A
EMS:	Non-PTP models: IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 VIEC 61000-4-8
Hazardous Locations:	Non-PTP models: ATEX, Class I Division 2
Maritime:	Non-PTP models: DNV-GL
Traffic Control:	Non-PTP models: NEMA TS2
Freefall:	IEC 60068-2-31
Shock:	IEC 60068-2-27
MTBF	
Time EDS-405A Series:	1,547,941 hrs
Standards:	Telcordia (Bellcore), GB



WARNING:

This equipment is intended to be used in a Restricted Access Location.

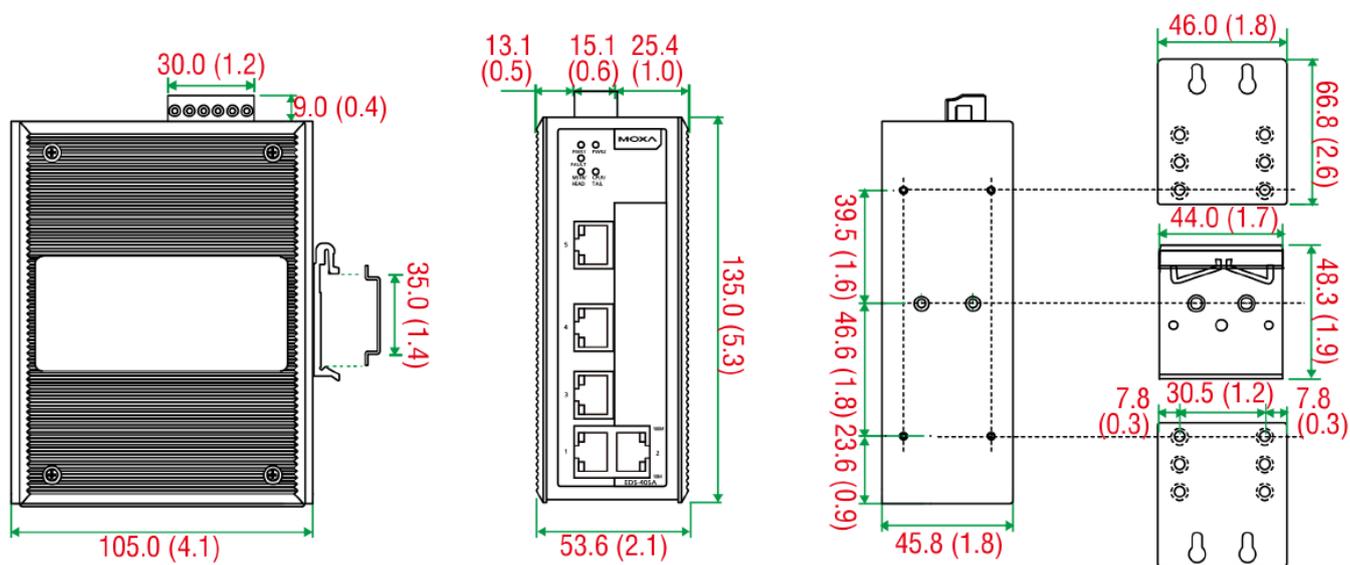


WARNING:

Hot surface! Before touching it, special attention or protection is required

3. Dimentions

Unit: mm (inch)



Model Name	Layer	Total No. of Ports	10/100BaseT(X) Ports RJ45 Connector	100BaseFX Ports Multi-Mode SC Connector	100BaseFX Ports Multi-Mode ST Connector	100BaseFX Ports Single-Mode SC Connector	Operating Temp.
EDS-405A	2	5	5	-	-	-	-10° to 60°C

FRONT PANEL VIEW	REAR PANEL VIEW	TOP PANEL VIEW	DESCRIPTION
			<ol style="list-style-type: none"> 1. Grounding screw 2. Terminal block for power input PWR1/PWR2 and relay output 3. Heat dissipation vents 4. Console port 5. DIP switches 6. Power input PWR1 LED 7. Power input PWR2 LED 8. Fault LED 9. MSTR/HEAD: LED indicator 10. CPLR/TAIL: LED indicator 11. TP port's 100 Mbps LED 12. TP port's 10 Mbps LED 13. Model Name 14. 10/100BaseT(X) ports 15. Screw hole for wall mounting kit

4. Operation

Communication connections:

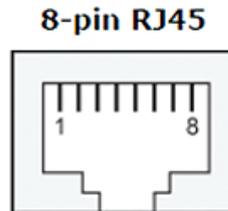
EDS-405A models have 3 or 5 10/100BaseT(X) Ethernet ports, and 0 (zero) 100 BaseFX (SC/ST-type connector) fiber ports. The 10/100BaseT(X) ports located on the EDS's front panel are used to connect to Ethernet-enabled device.

The picture on the bottom shows pinouts for both MDI (NIC-type) ports and MDI-X (HUB/Switchtype) ports, and shows cable wiring diagram for straight-through and cross over Ethernet cables:

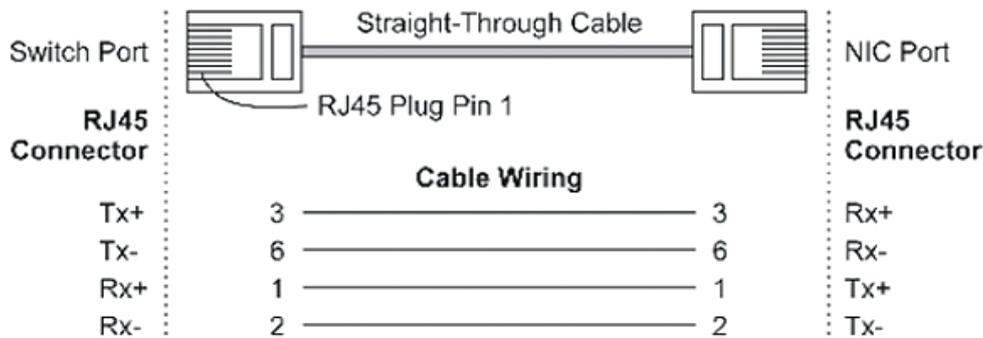
10/100Base T(x) RJ45 Pinouts

MDI Port Pinouts	
Pin	Signal
1	Tx+
2	Tx-
3	Rx+
6	Rx-

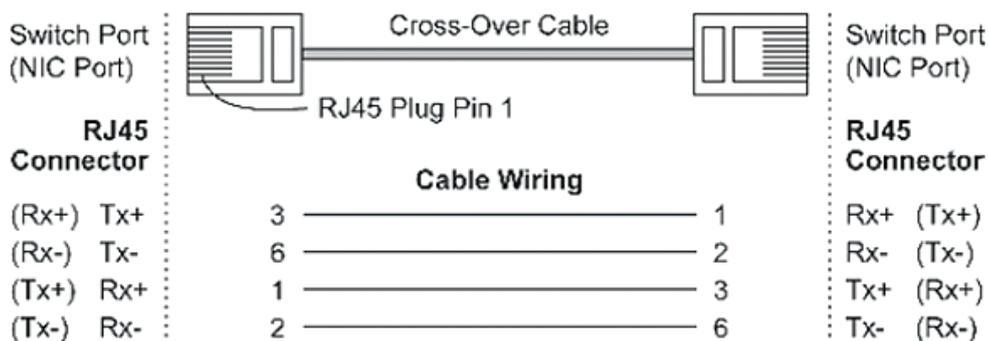
MDI-X Port Pinouts	
Pin	Signal
1	Rx+
2	Rx-
3	Tx+
6	Tx-



RJ45 (8-pin) to RJ45 (8-pin) Straight-Through Cable Wiring



RJ45 (8-pin) to RJ45 (8-pin) Cross-Over Cable Wiring



Turbo Ring Settings:

EDS-405A series switches are plug-and-play managed redundant Ethernet switches. The proprietary Turbo Ring protocol was developed by Moxa to provide better network reliability and faster recovery time. Moxa Turbo Ring's recovery time is less than 300 ms (Turbo Ring) or 20 ms (Turbo Ring V2) – compared to a 3 to 5 minute recovery time for commercial switches – decreasing the possible loss caused by network failures in an industrial setting.

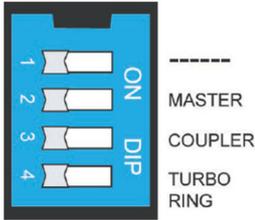
There are 4 Hardware DIP Switches for Turbo Ring on the top panel of the EDS-405A that can be used to set up the Turbo Ring easily within seconds.



NOTICE

Refer to the Turbo Ring DIP Switch section and Using Communication Redundancy section in the user’s manual for detailed information about the setting and usage of Turbo Ring and Turbo Ring V2.

DIP Switches:



The default setting for each DIP Switch is **OFF**.
The following table explains the effect of the setting the DIP Switch to the **ON** position.

“Turbo Ring” DIP Switch Settings

DIP 1	DIP 2	DIP 3	DIP 4
Reserved for future use.	ON: Enabled this EDS as the Ring Master. OFF: This EDS will not be the Ring Master.	ON: Enables the default “Ring Coupling” ports. OFF: <u>Do not use</u> this EDS as the ring coupler.	ON: Activates DIP switches 1, 2, 3 to configure “Turbo Ring” settings. OFF: DIP switches 1, 2, 3 will be disabled.

“Turbo Ring V2” DIP Switch Settings

DIP 1	DIP 2	DIP 3	DIP 4
ON: Enables the default “Ring Coupling (backup)” port. OFF: Enables the default “Ring Coupling (backup)” port.	ON: Enables the default “Ring Coupling (backup)” port. OFF: This EDS will not be the Ring Master.	ON: Enabled this EDS as the Ring Master. OFF: <u>Do not use</u> this EDS as the ring coupler.	ON: Activates DIP switches 1, 2, 3 to configure “Turbo Ring V2” settings. OFF: DIP switches 1, 2, 3 will be disabled.



NOTICE

If you do not enable any of the EDS-405A switches to be the Ring Master, the Turbo Ring protocol will automatically choose the EDS-405A with the smallest MAC address range to be the Ring Master. If you accidentally enable more than one EDS-405A to be the Ring Master, these EDS-405A switches will auto-negotiate to determine which switch will be the ring master.



NOTICE

To switch on the Master or Coupler functions of the DIP switch, you need to enable the Turbo Ring Pole first.

If you do not want to use a hardware DIP switch to set up Turbo Ring, you can use a web browser, Telnet, or console to disable this function.

The Turbo Ring DIP Switch page allows users to disable the 4th DIP switch located on the EDS's outer casing. The default is enabled with Turbo Ring v2 protocol. Once the user changes the 4th hardware DIP switch configuration to **ON**, the switch will start to initiate the Turbo Ring redundancy protocol based on the configuration. The detailed description is given below:

Turbo Ring DIP Switch

Disable the Turbo Ring DIP Switch

1. To enable the entire set of Hardware DIP switches, uncheck the "Disable the Turbo Ring DIP Switch" option.
2. To disable the entire set of Hardware DIP switches, check the "Disable the Turbo Ring DIP Switch" option.

Set DIP switch as Turbo Ring

Set DIP switch as Turbo Ring V2

Apply

Setting	Description	Factory default
Disable the Turbo Ring DIP Switch	<p>Unchecked: The Turbo Ring protocol will be activated automatically when the 4th DIP switch is moved to the ON position.</p> <p>Checked: The Turbo Ring protocol will not be activated automatically, regardless of the position of the 4th DIP switch.</p>	Unchecked
Set DIP switch as Turbo Ring	If the DIP switch is enabled, Turbo Ring protocol will be enabled when the DIP switch is moved to the ON position.	Set DIP switch as Turbo Ring v2
Set DIP switch as Turbo Ring v2	If the DIP switch is enabled, Turbo Ring v2 protocol will be enabled when the DIP switch is moved to the ON position.	

NOTICE
If the 4th DIP switch (Turbo Ring) is configured to **ON**, you will not be able to disable the Turbo Ring DIP switch from the web interface, console or Telnet.

NOTICE
If you would like to enable VLAN and/or port trunking on any of the last four ports, do not use the 4th DIP switch to activate Turbo Ring. In this case, you should use the Web, Telnet, or

If you do not want to use a hardware DIP switch to set up Turbo Ring, you can use a web browser, Telnet, or console to disable this function.

LED indicators

There are several LEDs on the EDS's front panel. The function of each LED is described in the following table:

LED	Color	State	Description
PWR1	AMBER	ON	Power is being supplied to power input PWR1.
		OFF	Power is not being supplied to power input PWR1.
PWR2	AMBER	ON	Power is being supplied to power input PWR2.
		OFF	Power is not being supplied to power input PWR2.
FAULT	RED	ON	<ol style="list-style-type: none"> 1. The signal contact is open. 2. The port has been disabled because the packets exceed the ingress rate limit. 3. The loop connection in a single switch is incorrect. 4. Invalid Ring port connection. 5. A failure during start-up.
		OFF	When a relay warning event is not triggered.
MSTR/ HEAD	GREEN	ON	<ol style="list-style-type: none"> 1. The switch is set as the Master of the Turbo Ring, or as the Head of the Turbo Chain. 2. Hardware initialization failed (+Stat on and Fault blinking). 3. The switch is set as the Root of RSTP.
		BLINKING	The EDS-405A has become the Ring Master of the Turbo Ring, or the Head of the Turbo Chain, after the Turbo Ring or the Turbo Chain is down.
		OFF	When the EDS-405A is not the Master of this Turbo Ring or is set as the Member of the Turbo Chain.
CPLR/ TAIL	GREEN	ON	When the EDS-405A coupling function is enabled to form a back-up path, or when it's set as the Tail of the turbo Chain.
		BLINKING	When the Turbo Chain is down.
		OFF	When the EDS-405A disables the coupling function, or is set as the Member of the Turbo Chain.
10M (TP)	GREEN	ON	TP port's 10 Mbps link is active
		BLINKING	Data is being transmitted at 10 Mbps.
		OFF	TP Port's 10 Mbps link is inactive.
100M (TP)	GREEN	ON	TP port's 100 Mbps link is active.
		BLINKING	Data is being transmitted at 100 Mps.
		OFF	TP Port's 100 Mbps link is inactive.
100M (FX)	GREEN	ON	FX port's 100 Mbps is active.
		BLINKING	Data is being transmitted at 100 Mps.
		OFF	FX port's 100 Mps is inactive.



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