

EXD-SH1/2 Controller for EX/CV with ModBus Communication Capability

EXD-SH1/2 are stand-alone universal superheat and or temperature controllers for air conditioning units or refrigeration systems.

Features

- EXD-SH1: Control of one valve
- EXD-SH2: Control of two valves in two independent circuits
- Main function

	Circuit 1	Circuit 2
EXD-SH1	Superheat or Temperature Control	
EXD-SH2	Superheat or Temperature Control	Superheat Control

- Other functions: Limitation of evaporating pressure (MOP), Low pressure switch, freeze protection and manual positioning of valve(s)
- Self-adapting superheat control function in conjunction with Emerson EX4-8 & CV4-7
- For multiple refrigerants, including ultralow temperature refrigerant R23 (only with ECN-Z60)
- Released for applications using A2L and A3 refrigerants
- Modbus (RTU) communication
- EXD-SH2: capability the operation of two evaporator/ EXV / Pressure sensor with single pressure transmitter
- Integrated keyboard with two lines display
- Monitoring of sensors and detection of sensor (ECN-Z.../TP1-.../PT5N-...) stepper motor wiring failures
- Optional upload/download key (accessory) for transmission of parameter settings among controllers with the same setting
- Low/high superheat alarm as well as other function alarms
- Electrical connection via plug-in type screw terminals included with controller and Micro Molex EXD-M03 (must be ordered separately)
- DIN rail mounting housing



EXD-SH2



EXD-M03

Selection Table

Type	Description	Part No.	
Controllers		Multipack (25 pieces)	Single Pack
EXD-SH1	Controller for single refrigeration circuit	-	807 855
EXD-SH2	Controller for two independent refrigeration circuits	-	807 856
EXD-M03	Molex terminal with 3 meter wires	-	807 865
Temperature Sensors		Multipack (20 pieces)	Single Pack
TP1-NP3	Temperature sensor with 3 meter cable	804489M	804 489
TP1-NP6	Temperature sensor with 6 meter cable	804490M	804 490
TP1-NP12	Temperature sensor with 12 m cable	804491M	804491
TP1-NH3	Temperature probe with 3 m cable	804485M	804485
TP1-NH6	Temperature probe with 6 m cable	804486M	804486
TP1-NH12	Temperature probe with 12 m cable	804487M	804487
ECN-Z60	Ultralow temperature sensor with 6 meter cable	-	807 826
Pressure Transmitters: PT5N (7/16-20UNF Connection)		Multipack (25 pieces)	Single Pack
PT5N-07M	Sensing pressure range -0.8...7 bar	805350M	805350
PT5N-18M	Sensing pressure range 0...18 bar	805351M	805351
PT5N-30M	Sensing pressure range 0...30 bar	805352M	805352
PT5N-50M	Sensing pressure range 0...50 bar	805353M	805353
PT5N-150D	Sensing pressure range 0...150 Bar (1/4 NPTF)	805379M	805379
Pressure Transmitters: PT5N (Brazing Connection)		Multipack (25 pieces)	Single Pack
PT5N-07T	Sensing pressure range -0.8...7 bar	805380M	805380
PT5N-10P-FLR	Sensing pressure range -0.8...10 bar	805391M	805391
PT5N-18T	Sensing pressure range 0...18 bar	805381M	805381
PT5N-30T	Sensing pressure range 0...30 bar	805382M	805382
PT5N-50T	Sensing pressure range 0...50 bar	805383M	805383

Note: Pressure Range 18 bar for System with R410A, 30 bar for R410A Economizer, 50/150 bar for CO₂

Accessories


Type	Description	Part No.	
M12 Plug And Cable For Pressure Transmitters PT5N		Multipack (20 Pieces)	Single Pack
PT4-M15	1.5 m	804 803M	804 803
PT4-M30	3.0 m	804 804M	804 804
PT4-M60	6.0 m	804 805M	804 805
PT4-M60-FLR	6.0 m cable length, 2-wire, ATEX certified		804 806
Uninterruptible Power Supply			
ECP-024	Backup Battery with Two Outputs for Two Controllers	-	804 558
K09-P00	Electrical Terminal Kit for ECP-024	-	804 560
EXD-PM	Super Cap for Only EXD-SH1 (Two Pieces of EXD-PM Required for One EXD-SH2)	-	807 854

Available Configuration Options

	Selectable Valves	
	EX4-8	CV4-7
Refrigerants	R11, R134a, R507, R404A, R407C, R410A, R124, R744, R407A, R407F, R23, R32*, R1234ze*, R448A, R449A, R450A, R513A, R290*, R1270*, R454C*, R452B*, R454B*, R454A, R452A, R444B*, R455A*, R1233zde, R1234yf	R744 (CO ₂)
Main Function	Superheat or and temperature control	
Pressure Transmitters	PT5N or 3rd party ratio metric	

Note: *) EXD-SH1/2 is not ATEX approved.


Technical Data: EXD-SH1/2

Supply Voltage	24 VAC/DC \pm 10%, 50/60 Hz
Power Consumption	EXD-SH1: Max. 25 VA EXD-SH2: Max. 50 VA
Terminals 1 to 12	Suitable for 12 Poles Molex Plug
Terminals 13 to 36	Suitable for Removable Screw Version: Wire Size 0.14 ... 1.5 mm ² Included in Controller Delivery
Protection Class	IP 00
Marking	


Mounting	DIN Rail Mounted
Accessory (12 Poles Molex Plug with 3 Meter Cable)	Type: EXD-M03 (to be Ordered Separately)

Optional EXD-PM Supercap

Supply Voltage	24 VAC/DC \pm 10%, 50/60 Hz
Output Voltage	12 VDC
Max. Output Current	-1.2 A -350 mA during charging
Power Consumption	12 VA
Terminals	Suitable for removable screw version: wire size 0.14...1.5 mm ²
Output: to Driver/Controller	Suitable for one EXD-SH1 Two EXD-PM for one EXD-SH2
Charging Time	60 seconds
Max. Cable Length Between EXD-PM and EXD-SH1/2	50 cm AWG18 wire size

Protection Class	24 VAC/DC \pm 10%, 50/60 Hz
Mounting	12 VDC
Temperatures Storage Operating/Surrounding	-20 °C...+70 °C -10 °C...+60 °C
Housing	Self-extinguishing ABS
Relative Humidity	20...85% non-condensing
Marking	
Weight	125 g

Optional Uninterruptible Power Supply ECP-024

Backup Battery Type	Lead acid gel rechargeable battery
Number of Backup Batteries	2, each 12VDC, 0.8 Ah
Supply Voltage	24 VAC \pm 10%, 50-60 Hz
Output Voltage, UB	18VDC
Number of Outputs to Drivers	2
Battery Recharge Time	Approximately 2 hours
Marking	

Protection Class	IP 20
Mounting	DIN rail mounted
Temperatures Storage Operating/Surrounding	-20 °C...+65 °C -10 °C...+60 °C
Housing	Aluminum
Relative Humidity	< 90% non-condensing
Connection	Screw terminals for wire size 0.5...2.5 mm ²
Accessories: Terminals	K09-U00 Part No: 804559
Weight	1200 g

Input, Output EXD-SH1/2

Description	Specification
Analogue Input(s): NTC Temperature Sensor Analogue Input: PT1000 Temperature Sensor	TP1-N... (-45...+150 °C operating range) ECN-Z60 (-80 ... -40 °C sensing range)
Analogue Input(s): 4...20 mA Pressure Transmitters Analogue Input(s): 0.5..... V Pressure Transmitters	PT5N Third Party Ratio Metric Pressure Transmitters(Total Error: ≤ 1%)
Digital input(s)	Dry Contact, Potential Free
Digital output(s): Alarm Relay(s) Contact is closed: During Alarm Condition Contact is open: During Normal Operation and Supply Power OFF	Resistive Load 24 V AC/DC, Max. 1 A Inductive Load 24 V AC, Max. 0.5 A
Communication	RS485 RTU Modbus, Two Wires