GPY+ Associates Engineering Inc.

Reviewed ☒	Reviewed as Modified ☐
Not Reviewed ☐	Revise and Resubmit ☐

This review is for conformance with the general design intent only and does not change the intent of the Contract Documents. Responsibility for errors or omissions in the shop drawings, details, co-ordination and dimensioning remains solely with the Contractor.

GPY+ Associates Engineering Inc.

Name: Sherwin Reyes

Date: March 7, 2025

MECHANICAL SHOP DRAWINGS

PROJECT: **York Region Administrative Centre – Interior Fit-up Package 'D'**

17250 Yonge Street,
Newmarket, Ontario
L3R 0T5

PROJECT NO.: GPY-9920

Shop Drawing No.: **M-10**

Product: **BAS technical data sheets**

Supplier: **Regulvar**

Comments:

1. **No Comments noted.**
2. **We recommend the shop drawings to be reviewed by electrical consultant for their comments.**

54 Audia Court, Unit 2
Concord, ON L4K 3N5
(905)-738-1400

Submittal 24-277-010

PROJECT NAME	PROJECT ADDRESS	DATE SUBMITTED
YORK REGION VARIOUS PROJECTS 24-277	17250 Young Street Newmarket, ON	Feb 7, 2025

TO	FROM
Tom Butkovic	PAUL LEDDY
COMPANY	COMPANY
TRISECT CONSTRUCTION	Consult Mechanical Inc.
EMAIL	EMAIL
tbutkovic@trisectconstruction.com	paul.l@consultmechanical.com
ADDRESS	ADDRESS
4020A SLADEVIEW cRESCENT, UNIT 7 MISSISSAUGA, ON L5L 6B1 JOB: 1300 INSLINGTON SUITE 103	54 Audia Court, Unit 2 Concord, ON L4K 3N5

Title

Regulvar Controls Submittal Package

Description

Regulvar Controls Submittal Package Technical Sheets

Package Items

SPEC	SUBSECTION	ITEM	TYPE

YRAB

PHASE D RENOVATION

TECHNICAL SHEETS

APPROVAL MANUAL

PROJECT NO:	2411-00450
ENGINEER:	**GPY & ASSOCIATES ENGINEERING INC.** 6 - 90 CENTURIAN DRIVE MARKHAM, ON L3R 8C5 Tel.: (905) 475-3138
CLIENT:	**CONSULT MECHANICAL INC.** 2 - 54, AUDIA COURT CONCORD, ON L4K 3N5 Tel.: (905) 738-1400
AUTOMATION REGULATION :	Régulvar Canada Inc.
Project Manager: Phone: E-mail:	Clarissa Soares 416-422-0531, Ext : 2406 csoares@regulvar.com

enteliBUS®

Automation Engine: Manager (eBMGR-2)

Description

The enteliBUS manager (eBMGR-2) is a fully programmable native BACnet® building controller. It supports multiple communications methods including, as standard, BACnet/IP, BACnet over Ethernet, BACnet MS/TP, and Delta LINKnet.

The manager is the automation engine of the enteliBUS control system. It contains the primary CPU, memory storage, and external communication ports. The manager also provides the control logic for enteliBUS I/O expansion backplanes.

An optional integrated LCD touchscreen provides local interface capabilities for viewing, modifying and configuring local I/O, variables, alarms, alarm logs, and schedules.

Application

The eBMGR-2 has multiple applications. By itself, it is a powerful system manager and BACnet router. With expansion backplane(s) attached, the eBMGR-2 functions as an expandable I/O controller.

Use the enteliBUS control system in low to medium density I/O applications to control a single piece of equipment, such as an AHU or chiller. Use it in high density I/O applications to control an entire mechanical room or central plant.

Features

- Native BACnet firmware
- Fully programmable
- BACnet Ethernet, BACnet/IP, and BACnet MS/TP communication ports
- Integrated LCD touchscreen interface (optional)
- Modular, expandable I/O
- Advanced fault detection and diagnostics
- Firmware upgrade and database load/save over the network
- LED status indications of power, CPU scan, and Ethernet ports
- Small footprint, DIN rail mountable
- Modular design provides flexibility, ease of service and reduced cost for future upgrades

Specifications

BACnet Device Profile
BACnet Building Controller (B-BC)
BACnet Gateway (B-GW)

LCD Touchscreen (Optional)
4.3 in. active-matrix LCD touchscreen
16-bit color, 480 × 272 resolution

Mounting
Snap mounts to standard 35 mm DIN rail

Device Addressing
Software addressed

Connectors
Removable screw-type terminal connectors

Wiring Class
Class 2 / SELV

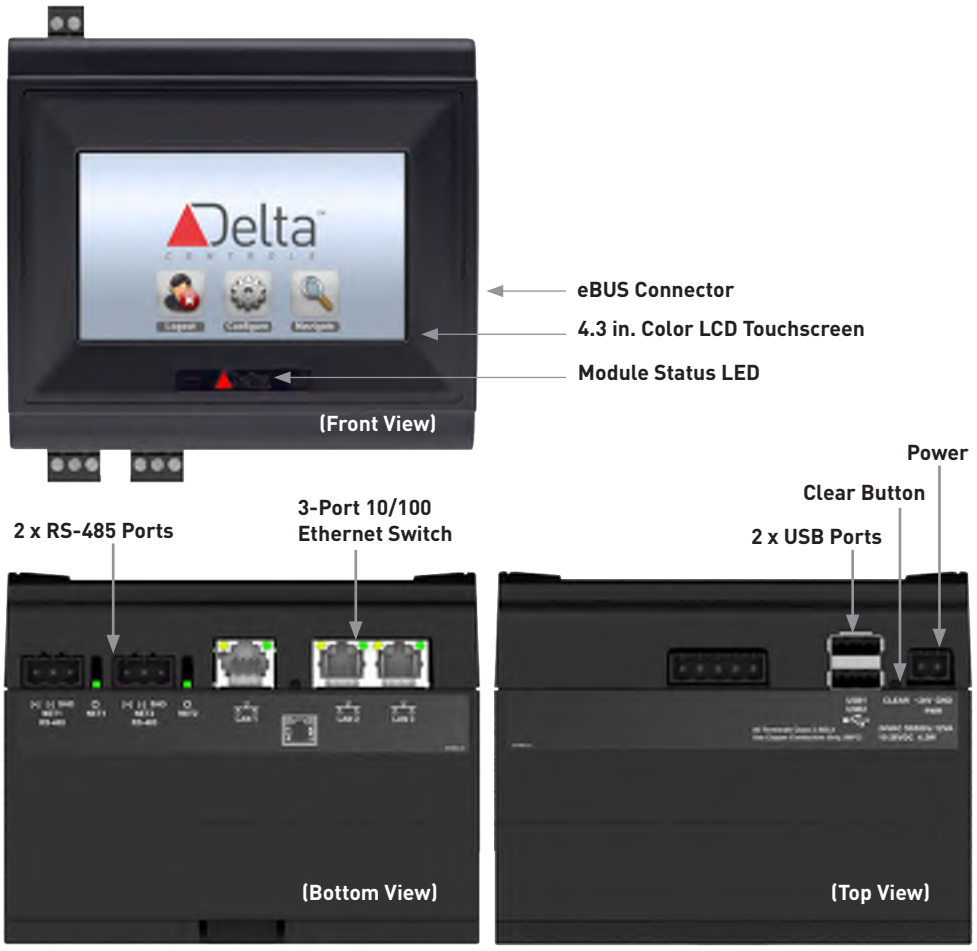
Power
24 VAC 50/60Hz @ 12 VA
10–28 VDC, 4.2 W

Technology
Arm® Cortex®-A8 CPU
256 MB SDRAM memory
4 GB flash memory
Real-time clock (temperature compensated)
Supercapacitor power backup for RTC and memory

Communication Ports
3-port 10/100 Ethernet switch
BACnet/IP, BACnet over Ethernet protocols supported
2 RS-485 ports (up to 76800 bps)
BACnet MS/TP, Delta LINKnet, and Modbus® protocols supported
2 USB host ports

enteliBUS®

eBMGR-2: Layout



Ordering

Order the eBMGR-2 or eBMGR-TCH-2 according to the following product numbers:

eBMGR-2	enteliBUS manager—CPU/Comm. module
eBMGR-TCH-2	enteliBUS manager—CPU/Comm. module with touchscreen LCD

Accessories

See online ordering for a complete list of all enteliBUS modules and accessories.

eBM-xxx	enteliBUS I/O modules
eBX-04	enteliBUS expander—I/O expander with 4-slot expander backplane
eBX-08	enteliBUS expander—I/O expander with 8-slot expander backplane

Specifications (Continued)

Ambient Rating for eBMGR-2
–30°C to 55°C (–22°F to 131°F)
10% to 95% RH (non-condensing)

Ambient Rating for eBMGR-TCH-2
0°C to 55°C (32°F to 131°F)
10% to 95% RH (non-condensing)

Dimensions
145 × 140 × 100 mm (5¾ × 5½ × 4 in.)

Weight
eBMGR-2: 214 g (0.472 lb)
eBMGR-TCH-2: 395 g (0.871 lb)

Enclosure Protection Rating
IP30

Compliance
CE
FCC
EAC

Listings
C-UL Listed
UL 916 Listed
BTL Listed

Updated 16 April 2020_r

Subject to change without notice.

Red5 Series

Red5-EDGE-ROOM

Description

The Red5-EDGE-ROOM is a fully programmable native BACnet building controller. As a primary integration engine of the Red5 system, the Red5-EDGE-ROOM contains memory storage and external communication ports, as well as the control logic for the expansion modules. The Red5-EDGE-ROOM can support up to 4 expansion modules.

The Red5-EDGE-ROOM supports multiple communication methods, including BACnet/IP, BACnet over Ethernet, BACnet MS/TP, and Delta LINKnet.

Application

The Red5 system is a complete solution that combines HVAC, access control and lighting control in a modular system. It combines multiple protocols and I/O points in one unit.

The Red5 system improves room control, avoids duplicate devices and offers a satisfying occupant experience at a lower energy cost.

The Red5-EDGE-ROOM single room controller is ideal for cost-sensitive applications where core features and single serial port connectivity are required.

Features

- Fully programmable
- BACnet/IP, BACnet over Ethernet and BACnet MS/TP communication ports
- Dual Ethernet ports
- Modular, expandable I/O. Modular design provides flexibility, ease of service and reduces cost of future upgrades.
- Fault detection and diagnostics
- Firmware upgrade and database load/ save over the network
- LED indicators for device status, NET and Ethernet ports
- USB expansion ports
- DIN rail mountable (EN 50022-35x7.5)

Specifications

BACnet Device Profile
BACnet Building Controller (B-BC)

Device Addressing
Software addressed

Connectors
Removable screw-type terminal connectors

Wiring Class
Class 2 / SELV

Power
24 VDC, 2 W typical (7 W max)
24 VDC, 100 W max output fully loaded

Power Out
75 W max

Technology
Arm® Cortex®-A8
32-bit 600 MHz RISC CPU
256 MB DDR3L RAM
4 GB eMMC flash memory
Real-time clock
Supercapacitor power backup for RTC and CPU

Communication Ports
2 Ethernet (10/100-Base T)

BACnet/IP, BACnet over Ethernet, BACnet/SC

1 RS-485 port supporting up to 4 devices with the following protocols:
BACnet MS/TP up to 76800 bps
Delta LINKnet up to 76800 bps
Modbus RTU up to 115200 bps

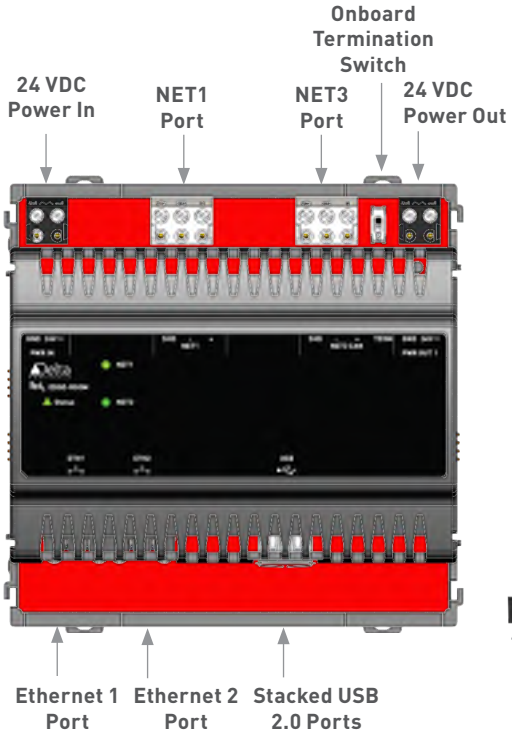
1 CAN bus port supporting up to 2 O3-HUB devices

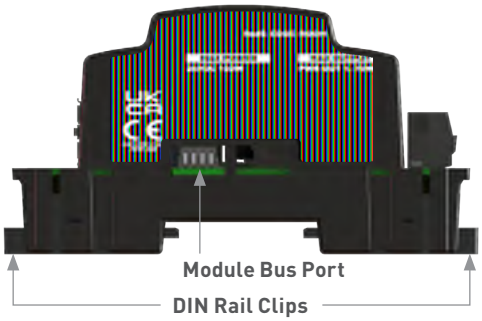
2 USB 2.0 ports

NFC, passive, two-way, short range

Red5 Series

Red5-EDGE-ROOM





Order the Red5-EDGE-ROOM with one or more modules or hubs:

Base Unit

Red5-EDGE-ROOM	Base unit: 2 network ports, 2 Ethernet ports, 1 power output, Modbus RTU, NFC

Modules and Hubs

Red5-MODULE-4F4xP	I/O module: 4 universal I/O, 4 FET binary outputs
Red5-MODULE-8xP	I/O module: 8 universal I/O
Red5-MODULE-1DOOR	Access module, single door support
Red5-MODULE-DALI	DALI lighting module: DALI interface, 100 mA power output
Red5-MODULE-PoE	Power over Ethernet module (IEEE 802.3at)
Red5-MODULE-SMI	SMI module for motorized blinds: SMI interface, 30 mA power output
O3-HUB	Sensor hub (temp, hum, light, motion, Bluetooth, LED ring, microphone, speaker)
O3-HUB-En868	O3-HUB with EnOcean 868 MHz
O3-HUB-En902	O3-HUB with EnOcean 902 MHz

Specifications (Continued)

Ambient Rating
–30°C to 55°C (–22°F to 131°F)
10% to 95% RH (non-condensing)

Dimensions
108 × 111 × 58 mm
(4.25 × 4.37 × 2.28 in.)

Weight
193 g (0.425 lb)

Enclosure Protection Rating
IP20

Compliance
CE
FCC

Listings
C-UL Listed
UL 916 Listed

Updated January 2023

Subject to change without notice.

Red5-EDGE-ROOM

Power Supplies

DRC-24V30W1AZ	Chrome Line Voltage DC power supply 24 V 30 W Class A EMC
DRC-24V60W1AZ	Chrome Line Voltage DC power supply 24 V 60 W Class A EMC
DRC-24V100W1AZ	Chrome Line Voltage DC power supply 24 V 100 W Class A EMC
DRS-24V30W1NZ	Sync Line Voltage DC power supply 24 V 30 W Class B EMC
DRS-24V50W1NZ	Sync Line Voltage DC power supply 24 V 50 W Class B EMC
DRS-24V100W1NZ	Sync Line Voltage DC power supply 24 V 100 W Class B EMC

Red5 Series

Red5-PLUS-ROOM

Description

The Red5-PLUS-ROOM is a fully programmable native BACnet building controller. As the primary integration engine of the Red5 system, the Red5-PLUS-ROOM contains memory storage and external communication ports, as well as control logic for the expansion modules. The Red5-PLUS-ROOM can support up to 12 I/O or gateway modules and up to 24 access modules, as long as the total number of modules does not exceed 24.

The Red5-PLUS-ROOM supports multiple communication methods, including BACnet/IP, BACnet over Ethernet, BACnet MS/TP and Delta LINKnet.

Application

The Red5 system is a complete solution that combines HVAC, access control and lighting control in a modular system, with multiple protocols and I/O points in one unit.

The Red5 system improves room control, avoids duplicate devices and offers a satisfying occupant experience at a lower energy cost.

Features

- Fully programmable
- BACnet/IP, BACnet over Ethernet and BACnet MS/TP communication ports
- Dual Ethernet ports
- Modular, expandable I/O. Modular design provides flexibility, ease of service and reduces cost of future upgrades.
- Advanced fault detection and diagnostics
- Firmware upgrade and database load/ save over the network
- LED indicators for device status, NET and Ethernet ports
- USB expansion ports
- DIN rail mountable (EN 50022-35x7.5)

Specifications

BACnet Device Profile
BACnet Building Controller (B-BC)

Device Addressing
Software addressed

Connectors
Removable screw-type terminal connectors

Wiring Class
Class 2 / SELV

Power
24 VDC, 2 W typical (5 W max)
24 VDC, 100 W max output fully loaded

Power Out
1 24 VDC switched power output
- Short circuit protected
- Overcurrent protected

2 24 VDC unswitched power outputs

Technology
Arm® Cortex®-A8
32-bit 600 MHz RISC CPU
256 MB DDR3L RAM
4 GB eMMC flash memory
Real-time clock
Supercapacitor power backup for RTC and CPU

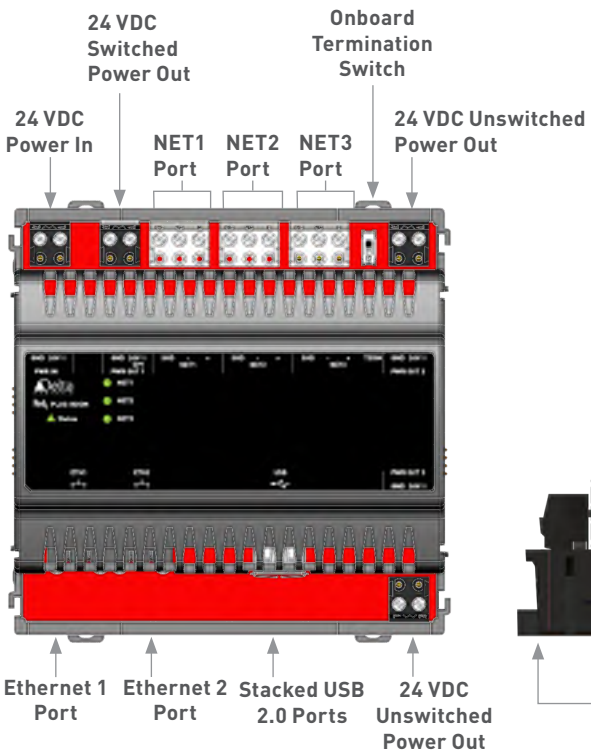
Communication Ports
2 Ethernet (10/100-Base T)
- BACnet/IP, BACnet over Ethernet, BACnet/SC

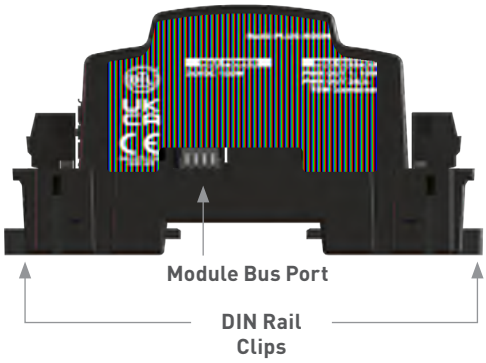
3 RS-485 ports supporting:
- BACnet MS/TP up to 76800 bps, max 16 devices per Red5-PLUS-ROOM
- Delta LINKnet up to 76800 bps, max 12 devices per Red5-PLUS-ROOM*
- Modbus RTU up to 115200 bps, max 16 devices per Red5-PLUS-ROOM

* Limit is 12 devices in V4.13 firmware or later. Otherwise, limit is 8.

Red5 Series

Red5-PLUS-ROOM





Order the Red5-PLUS-ROOM with one or more modules or hubs:

Base Unit

Red5-PLUS-ROOM	Base unit: 3 network ports, 2 Ethernet ports, 3 power outputs, Modbus RTU, NFC

Modules and Hubs

Red5-MODULE-4F4xP	I/O module: 4 universal I/O, 4 FET binary outputs
Red5-MODULE-8xP	I/O module: 8 universal I/O
Red5-MODULE-1DOOR	Access module, single door support
Red5-MODULE-DALI	DALI lighting module: DALI interface, 100 mA power output
Red5-MODULE-PoE	Power over Ethernet module (IEEE 802.3at)
Red5-EXPAND-04	Power injector for Red5 expansion supporting up to 4 modules
Red5-MODULE-SMI	SMI module for motorized blinds: SMI interface, 30 mA power output
O3-HUB	Sensor hub (temp, hum, light, motion, Bluetooth, LED ring, microphone, speaker)
O3-HUB-En868	O3-HUB with EnOcean 868 MHz
O3-HUB-En902	O3-HUB with EnOcean 902 MHz

Specifications (Continued)

Communication Ports (Continued)
1 CAN bus port

2 USB 2.0 ports

Ambient Rating
–30°C to 55°C (–22°F to 131°F)
10% to 95% RH (non-condensing)

Dimensions
108 × 111 × 58 mm
(4.25 × 4.37 × 2.28 in.)

Weight
193 g (0.425 lb)

Enclosure Protection Rating
IP20

Compliance
CE
FCC

Listings
cULus 916 Listed

Updated January 2023

Subject to change without notice.

Red5 Series

Red5-PLUS-ROOM

Power Supplies

DRC-24V30W1AZ	Chrome Line Voltage DC power supply 24 V 30 W Class A EMC
DRC-24V60W1AZ	Chrome Line Voltage DC power supply 24 V 60 W Class A EMC
DRC-24V100W1AZ	Chrome Line Voltage DC power supply 24 V 100 W Class A EMC
DRS-24V30W1NZ	Sync Line Voltage DC power supply 24 V 30 W Class B EMC
DRS-24V50W1NZ	Sync Line Voltage DC power supply 24 V 50 W Class B EMC
DRS-24V100W1NZ	Sync Line Voltage DC power supply 24 V 100 W Class B EMC

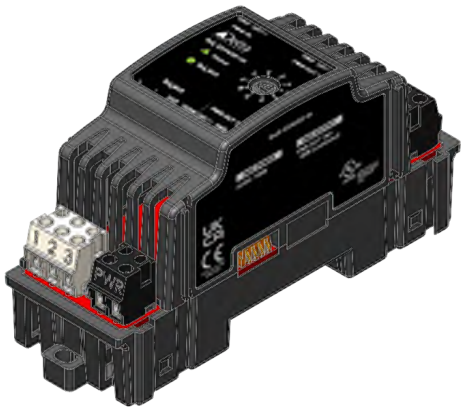
Red5 Series

Red5-EXPAND-04: Power Injector

Description

The Red5-EXPAND-04 power injector increases the number of Red5 modules on an Red5 system by providing power to a maximum of 4 Red5 I/O or gateway modules. These power injector expansions can be located up to 70 m (230 ft) away and still be directly controlled by the Red5-PLUS-ROOM room controller.

Using power injectors, HVAC, access and lighting control can be centralized on single controller. The Red5 system's modular nature also has the flexibility to grow to meet future needs of the site without additional wiring costs.



Application

The Red5 system is a complete solution that combines HVAC, access control and lighting control in a modular system.

Features

- A series of power injector units adds up to 12 Red5 modules to a single Red5-PLUS-ROOM room controller
- Small footprint, DIN rail mounted
- Power injectors can be externally powered or powered by the Red5-PLUS-ROOM controller

Specifications

Device Addressing
Set via rotary switch

Connectors
Removable screw-type terminal connectors

Wiring Class
Class 2 / SELV

Power
24 VDC, 100 W

Power Out
80 W (PWR OUT 1 and 2)

Ambient Rating
–30°C to 55°C (–22°F to 131°F)
10% to 95% RH (non-condensing)

Dimensions
36 × 111 × 58 mm (1.42 × 4.37 × 2.28 in.)

Weight
70 g (0.15 lb)

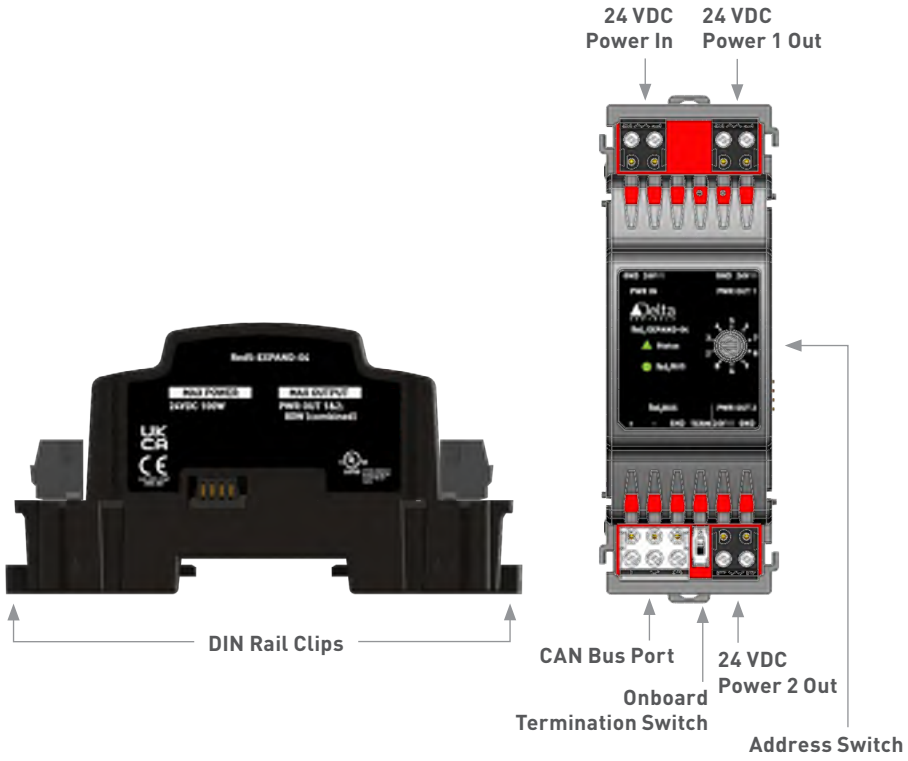
Compliance
CE

Listings
C-UL Listed
UL 916 Listed

Updated September 2023

Red5 Series

Red5-EXPAND-04: Power Injector



Order the Red5-PLUS-ROOM with one or more modules or hubs:

Base Unit

Red5-PLUS-ROOM	Base unit: 3 network ports, 2 Ethernet ports, 3 power outputs, Modbus

Modules and Hubs

Red5-EXPAND-04	Power injector for Red5 expansion supporting up to 4 modules
Red5-MODULE-4F4xP	I/O module: 4 universal I/O, 4 FET binary outputs
Red5-MODULE-8xP	I/O module: 8 universal I/O
Red5-MODULE-1DOOR	Access module, single door support
Red5-MODULE-DALI	DALI lighting module: DALI interface, 100 mA power output
Red5-MODULE-PoE	Power over Ethernet module (IEEE 802.3at)
Red5-MODULE-SMI	SMI module for motorized blinds: SMI interface, 30 mA power output
O3-HUB	Sensor hub (temp, hum, light, motion, Bluetooth, LED ring, microphone, speaker
O3-HUB-En868	O3-HUB with EnOcean 868 MHz
O3-HUB-En902	O3-HUB with EnOcean 902 MHz

Subject to change without notice.

Red5-EXPAND-04: Power Injector

Power Supplies

DRC-24V30W1AZ	Chrome Line Voltage DC power supply 24 V 30 W Class A EMC
DRC-24V60W1AZ	Chrome Line Voltage DC power supply 24 V 60 W Class A EMC
DRC-24V100W1AZ	Chrome Line Voltage DC power supply 24 V 100 W Class A EMC
DRS-24V30W1NZ	Sync Line Voltage DC power supply 24 V 30 W Class B EMC
DRS-24V50W1NZ	Sync Line Voltage DC power supply 24 V 50 W Class B EMC
DRS-24V100W1NZ	Sync Line Voltage DC power supply 24 V 100 W Class B EMC

enteliZONE™

Network Sensors: eZNS-T100

Description

The eZNS-T100 network sensor offers building occupants an intuitive touch interface to adjust individual comfort levels while tailoring to the needs of their specific market. Featuring a standard temperature sensor with humidity, CO_2 and motion options, the eZNS also offers a choice of backlit colors to provide additional user feedback and esthetic appeal.

The eZNS sensor's NFC technology allows installers to use NFC-enabled mobile devices to configure the eZNS and enable enteliWEB integration.

Application

The eZNS is suitable for a wide range of sensing applications, from basic temperature monitoring, to indoor air quality and occupancy sensing. A customizable interface allows for intuitive user interaction.

An available external input allows for additional zone monitoring such as window or door contact, temperature averaging or other dry contact sensor information.

When paired with an application controller, the eZNS supports advanced control strategies, such as demand control ventilation, energy savings based on occupancy and optimal user comfort.

Features

- RGB backlight allows choice of colors to indicate conditions, alarms and night mode
- Large easy-to-read LCD screen. On-screen visual feedback on button selection.
- Capacitive touch zones allow custom button sizes
- Multiple button layout options. Simple one-touch buttons, or two-touch buttons for added functionality.
- Slider to quickly adjust setpoint or tap for precise changes
- Fully programmable in GCL+
- USB service port, software enabled or disabled. Service tool not required.
- Smartphone and tablet integration and setup using NFC technology
- Fits most electrical boxes worldwide
- Two-piece design with tamper set screw lock

Specifications

Inputs
1 10 kΩ input

LCD (Optional)
2-line custom segmented display with icons

Buttons
2 rows of 4 capacitive touch zones, allowing up to 8 individual buttons or combined to form larger buttons

Backlight (Optional)
Optional RGB LED backlight for multicolor LCD and button illumination

Temperature
Digital temperature sensor
± 0.2°C (± 0.36°F)

Humidity Sensor (Optional)
Accuracy ± 3%

CO_2 Sensor (Optional)
Dual-channel NDIR detection

Range: 0–2000 ppm

Accuracy @ 25°C (77°F):
± (30 ppm + 3% of value)

Occupancy Sensor (Optional)
Passive infrared motion (PIR) sensor

Range: 5 m (16.4 ft.)

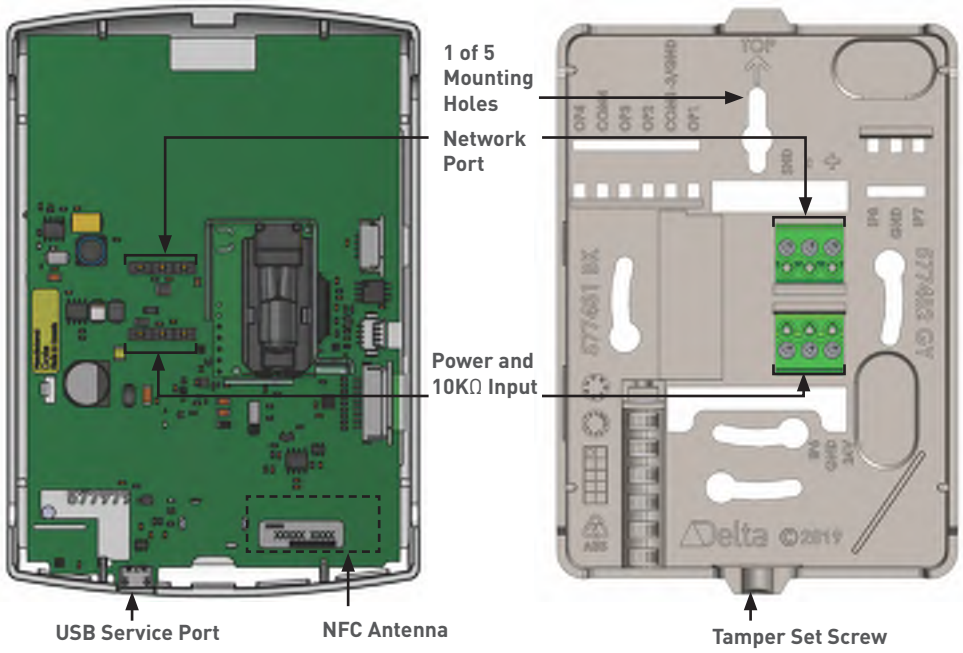
Coverage: 100° horizontal

Connectors
Screw-type terminal connectors

Wiring Class
Class 2 / SELV

enteliZONE™

eZNS-T100: Board Layout Diagram



eZNS-T100: Dimensions and Backplate Options

Specifications (Continued)

Power
24 V AC/DC
2VA / 1.2W Max (eZNS-T100CHM-B)

Technology
32-bit processor
Internal A/D, Flash and RAM

Communications
RS-485 port
Delta LINKnet (up to 76800 bps)

USB service port
Used as virtual Com port to connect the BACnet® network to a workstation

Near Field Communication (NFC)
Passive 2-way short range

Ambient
0°C to 55°C (32°F to 131°F)
10% to 90% RH (non-condensing)

Dimensions
With SM or SC backplate:
133 × 93 × 23 mm (5.3 × 3.6 × 0.9 in.)

Weight
165 g (0.36 lb)

IP Rating
IP20

Compliance
CE
FCC Class B

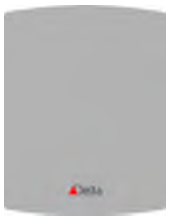
Listings
UL 916 Listed

Updated May 2022

Subject to change without notice.

enteliZONE™

eZNS-T100: Standard Button Overlay Options



Overlay 000

Overlay 003

Overlay 005

Overlay 009

Overlay 045

Overlay 046

Overlay 047

Overlay 053

Overlay 100

eZNS-T100: Color Options

WWG: White Button Overlay, White Front, Grey Back

GWG: Grey Button Overlay, White Front, Grey Back

BBB: Black Button Overlay, Black Front, Black Back

enteliZONE™

eZNS-T100-B-R-044-WWG

eZNS-T100M-ND-R-000-WWG

Ordering

The product number of the eZNS-T100 is eZNS-T100aaa-bb-cc-ddd-eee where the letters correspond to the different options listed below:

Sensor Options (aaa-)

C	CO_2
H	Humidity
M	Motion
HM	Humidity and Motion
CH	CO_2 and Humidity
CM	CO_2 and Motion
CHM	CO_2, Humidity and Motion

Display Options (-bb-)

B	RGB Backlit Display / Buttons
NB	No Backlighting
ND	No Display

Backplate Options (-cc-)

SC	Backplate for CO_2 models[1]
SM	Backplate for non-CO_2 models

[1]eZNS CO_2 models uses a CO_2 sensor that allows for flush wall mounting, however requires a SC backplate not compatible with the non-CO2 SM backplate.

Button Overlay Options (-ddd-)

###	Standard Button Overlay Number
###	Library Button Overlay Number[2]
000	Blank Overlay (No Display)
999	Custom Button Overlay[3]

[2]See eZNS Button Overlay Design Guide. Expect up to 8 weeks for delivery. Additional charges apply.

Button Overlay and Plastic Color Options (-eee-)

WWG	White Button Overlay, White Front with Grey Backplate (default)
GWG	Grey Button Overlay, White Front with Grey Backplate
BBB	Black Button Overlay, Black Front with Black Backplate
Custom	Custom Color Options[3]

[3]Contact inside sales for pricing and more information.

Accessories

400662	eZNx Foam Back Insulator (For SM and SC Backplates)

G2RL and ZD35

Miniature power relay and socket

Description

The G2RL is a power relay, single pole double throw, which is used together with a ZD35 socket.

CSA certified and compliant with UL standards, the coil insulation is rated Class F.

Application

The G2RL+ZD35 is mainly used In HVAC applications, it can be used together with heating devices, cooling devices, damper actuators, starters, etc.

Technical data – relay

Maximum operating frequency	Mechanical: 18 000 operations/h Electrical: 1 800 operations/h at rated load
Life span	20 million operations (at 18 000 operations/h)
Rated voltage	12 Vdc
Rated current	20.8 mA
Coil resistance	576 Ω
Must operate voltage	75% max. of rated voltage
Must release voltage	10% min. of rated voltage
Rated load	10 A at 250 Vac 10 A at 24 Vdc
Current-carrying capacity	10 A
UL recognized and CSA certified (at ambient temp.)	Coil: 5 at 24 Vcc Contacts: 10 A at 250 Vac 10 A at 24 Vdc

Technical data – socket

Rated voltage	300 Vac
Rated current	12 A (per pole)
Insulation voltage	> 5 kV
Protection degree	IP 20
Socket material	Self-extinguishing – PA6+GF
Contacts spring	Cu Zn 33
Hold down spring	Plastic
Approvals	UL/CSA (12 A 300 Vac)

To order

When ordering this product, please order these two items using their individual item numbers.

Miniature power relay (Omron)	G2RL1HDC12
Socket	ZD35

Optional

Plug-in device with diode and LED red warning light, and protection against inversion.

Device with LED and diode (in white in the picture below)	939.90.33.3

O3 Hub

O3-HUB Sensor Hub

Description

The ceiling-mounted O3® Hub multisensor is part of the O3-DIN room control system designed for the modern smart building. The sensor hub replaces multiple room sensors with a one-per-room competitive cost solution when installed together with an O3-DIN room controller.

The sensor hub provides occupant- and location-based control for the modern office or meeting space. Using the O3 mobile app, room occupants can select from a list of preconfigured settings or they can interact with the sensor hub directly to manage room comfort.

Application

The O3 Hub is ideal for a wide range of room applications, such as offices, conference rooms, classrooms and apartments, incorporating location-based services and mobile app interactions into the occupant experience.

Models with I/O are ideal for controlling nearby lighting or for use in chilled beam applications.

Built-in Bluetooth® and optional EnOcean® technology allows for flexible room design with wireless devices.

Features

- Combines humidity, composite temperature, passive infrared motion, and light sensors in a single device
- Up to 8 sensor hubs per O3-DIN-CPU controller; up to 2 sensor hubs per O3-DIN-SRC controller
- Supports up to 32 EnOcean wireless input devices
- Bluetooth beacon broadcasts identifiers to Bluetooth-enabled smartphones with the O3 app installed
- Full-color LED ring provides silent indications to room occupant
- Audio tones provide user feedback

Specifications

Temperature Sensors
Composite temperature value
±0.5°C (±1.0°F) with calibration

Digital temperature sensor
±0.5°C (±1.0°F)

Infrared temperature sensor
±1.0°C (±1.8°F) typical

Humidity Sensor
Accuracy ±3% for 20% to 80% RH
@ 15°C to 30°C (59°F to 86°F)

Motion Sensor
Passive infrared (PIR) motion sensor

Motion sensing range:

6.7 m (22 ft) diameter @ 3 m (10 ft) mounting height

5.5 m (18 ft) diameter @ 2.4 m (8 ft) mounting height

Light Sensor
±(6 + 5% reading) lx

Audio Input
2 microphones for acoustic occupancy detection

LED Ring
Full color articulated with 12 RGB LEDs

Universal Points (O3-HUB-02 only)
Up to 2 inputs (16-bit), software configurable for the following types:

0–5 VDC

0–10 VDC

10 kΩ thermistor

Dry contact (using 10 kΩ thermistor software setting)

4–20 mA (using external 250 Ω resistor on 0–5 V setting)

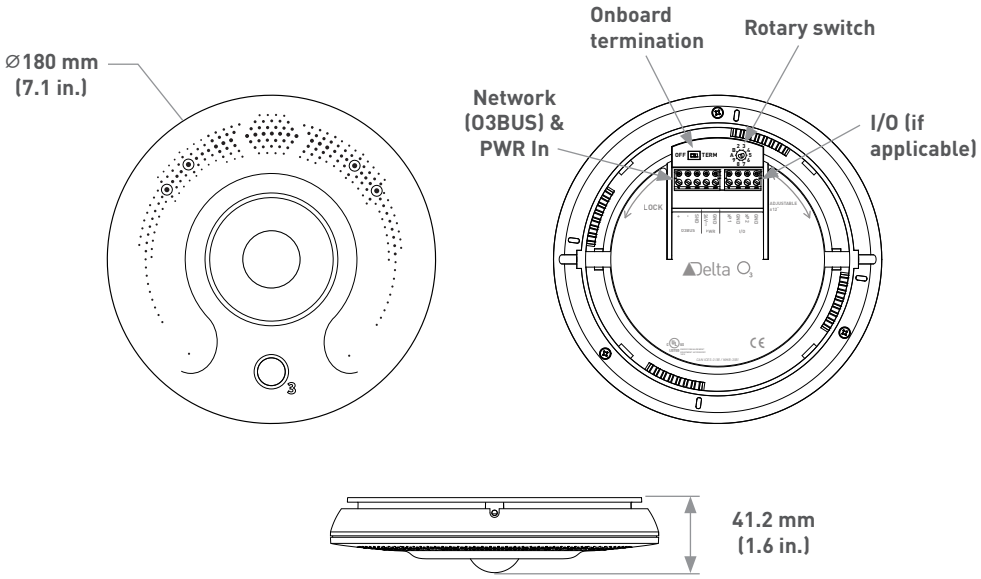
Up to 2 outputs (12-bit), software configurable for the following types:

0–10 V @ 20 mA max (sourcing)

1–10 V @ 10 mA max (sinking) for hardware rev 2.7 and later

O3 Hub

O3-HUB Sensor Hub



Order an O3-DIN system base unit with one or more hubs or modules:

Base Units

O3-DIN-CPU	3 network ports, 2 Ethernet ports, 3 power outputs, Modbus RTU, NFC
O3-DIN-SRC	2 network ports, 2 Ethernet ports, 1 power output, Modbus RTU, NFC

Sensor Hubs

O3-HUB-00	Multisensor (temperature, humidity, light, motion, Bluetooth, LED ring, microphone and speaker) with mounting plate
O3-HUB-02	Multisensor (temperature, humidity, light, motion, Bluetooth, LED ring, microphone and speaker), 2 universal I/O, input (0–10 V, 0–5 V, 10 kΩ) or output (20 mA source, 10 mA sink), with mounting plate
O3-HUB-02-E8	Multisensor (temperature, humidity, light, motion, Bluetooth, EnOcean 868 MHz, LED ring, microphone and speaker), 2 universal I/O, input (0–10 V, 0–5 V, 10 kΩ) or output (20 mA source, 10 mA sink), with mounting plate
O3-HUB-02-E9	Multisensor (temperature, humidity, light, motion, Bluetooth, EnOcean 902 MHz, LED ring, microphone and speaker), 2 universal I/O, input (0–10 V, 0–5 V, 10 kΩ) or output (20 mA source, 10 mA sink), with mounting plate

Specifications (Continued)

Audio Output
1.0 W mono speaker for tones and audio output

Device Addressing
Rotary switch

Connectors
Removable screw-type terminal connectors

Wiring Class
Class 2 / SELV

Power
24 VDC, 1 W typical, 7 W max (non-2xP) or 8 W max (2xP), Class 2*
*Power can be supplied from an O3-DIN controller

Communications
EnOcean (868 MHz or 902 MHz)
Bluetooth Low Energy beacon (V4.2)
O3BUS port (CAN-based)
IR transmitter

Ambient Rating
0°C to 45°C (32°F to 113°F)
10% to 95% RH (non-condensing)

Dimensions
180 × 41.2 mm (7.1 × 1.6 in.)

Weight
350 g (0.77 lb)

Compliance
CE
EAC
FCC/IC
- Bluetooth FCC ID: XPYNINAB1
- Bluetooth IC ID: 8595A-NINAB1
- EnOcean 902 MHz
- FCC ID: ZV-STM300U
- IC ID: 713A-STM300U

Listings
cULus 916 Listed

Updated May 2021

O3 Hub

O3-HUB Sensor Hub

O3-DIN Modules

O3-DIN-4F4xP	FET I/O module: 4 universal I/O, 4 FET binary outputs
O3-DIN-8xP	I/O module: 8 universal I/O, input (0–10 V, 0–5 V, 10 kΩ) or output (20 mA source, 10 mA sink)
O3-DIN-ACCESS	Access module, single door support
O3-DIN-DALI	DALI lighting module: DALI interface, 100 mA power output
O3-DIN-PoE	Power over Ethernet module
O3-DIN-PWRINJ	Power injector expansion for O3
O3-DIN-SMI	SMI module for motorized blinds: SMI interface, 30 mA power output

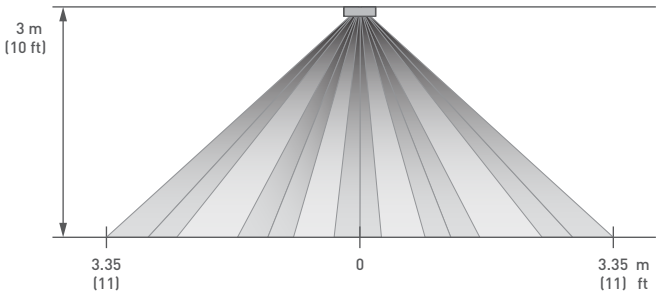
Power Supplies

DRC-24V30W1AZ	Chrome Line Voltage DC power supply 24 V 30 W Class A EMC
DRC-24V60W1AZ	Chrome Line Voltage DC power supply 24 V 60 W Class A EMC
DRC-24V100W1AZ	Chrome Line Voltage DC power supply 24 V 100 W Class A EMC
DRS-24V30W1NZ	Sync Line Voltage DC power supply 24 V 30 W Class B EMC
DRS-24V50W1NZ	Sync Line Voltage DC power supply 24 V 50 W Class B EMC
DRS-24V100W1NZ	Sync Line Voltage DC power supply 24 V 100 W Class B EMC

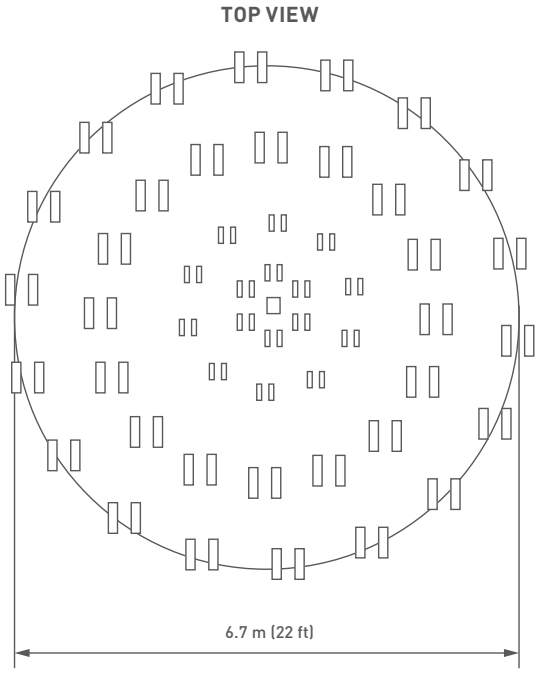
Passive Infrared Motion Coverage

Mounting Height	PIR Sensing Range
3 m (10 ft)	6.7 m (22 ft)
2.4 m (8 ft)	5.5 m (18 ft)

SIDE VIEW



TOP VIEW



Subject to change without notice.

Delta CONTROLS
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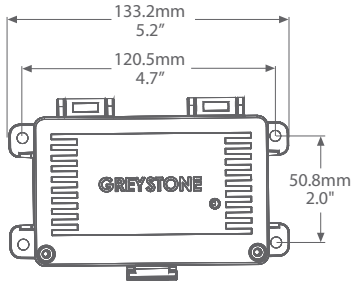
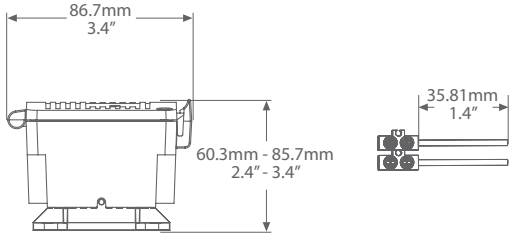
ENERGY SYSTEMS INC

WATER DETECTOR, REMOTE SPOT





WLDR SERIES

PRODUCT DESCRIPTION

The remote spot water detector is used to detect the presence of water or conductive liquids. It is available with either one or two relay outputs and is designed to signal alarms if one or more of three conditions are met: water is detected, power is lost to the unit, or if there is an internal failure.

The remote spot water detector is housed in an IP65 rated enclosure with remote sensing probes and cable that is available in various lengths. It features height adjustable mounting legs that include 5 preset mounting heights. An LED provides visual status indication.

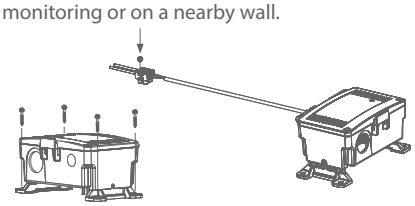
SPECIFICATIONS

POWER SUPPLY	12 - 27 Vac/dc
SUPPLY CURRENT	125 mA max @ 24 Vac
ALARM OUTPUTS	1 or 2 Form C relay(s), NO/NC, rated 2 Amps @ 30 VAC/VDC, 0.5 Amps @ 120 VAC (resistive load)
VISUAL INDICATION	Bi-color LED - Green, Red
OPERATING TEMPERATURE	0 to 50°C (32 to 122°F)
ENCLOSURE	ABS with hinged and gasket cover, IP65 (NEMA 4X)
DIMENSIONS	133.2mm L x 86.7mm W x 60.3-85.7mm H (5.2" x 3.4" x 2.4"- 3.4")
CABLE TYPE	FT-6 Plenum rated
APPROVALS	CE, RoHS
COUNTRY OF ORIGIN	Canada

TYPICAL INSTALLATION

For complete installation and wiring details, please refer to the product installation instructions.

The water detector enclosure can be mounted directly to the floor of the area requiring monitoring or on a nearby wall.



APPLICATION

The following chart gives examples of what types of fluids the WLD can and cannot be used to detect.

FLUIDS THAT CAN BE DETECTED	FLUIDS THAT CAN'T BE DETECTED
City water	Pure water
Sea water	Gasoline
Copper sulfate solution	Oil
Weak acid	Brake fluid
Weak base	Alcohol
Household ammonia	Ethylene glycol
Water & glycol mixture	Parafin
Wet soil	Dry soil
Coffee	Whiskey

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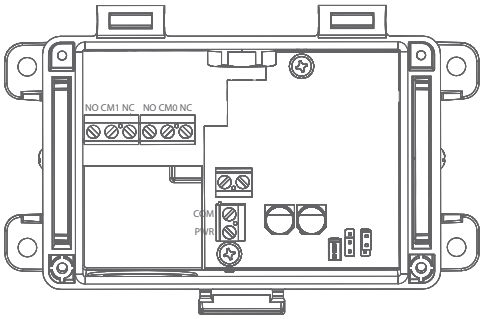
WIRING INFORMATION



TERMINAL	FUNCTION
NO	Normally Open Contact
CM1	COMMON
NC	Normally Closed Contact
NO	Normally Open Contact
CM2	COMMON
NC	Normally Closed Contact
COM	COMMON
PWR	+24 VAC/DC

*Terminals only present if option is ordered

ORDERING

PRODUCT	**WLDR**	Water Detector, Remote Spot
RELAY	**1** **2**	1 Relay 2 Relay
REMOTE CABLE LENGTH	**00** **02** **05** **10**	No Cable (Remote Sensor Probes Only) 2m (6.5') 5m (16.4') 10m (32.8')

NOTE: Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

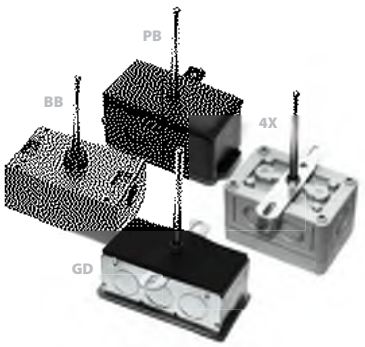
PART NUMBER

WLDR

RoHS COMPLIANT

Greystone Energy Systems, Inc.
150 English Drive, Moncton,
New Brunswick, Canada E1E 4G7

Ph: +1 (506) 853-3057 Fax: +1 (506) 853-6014
North America: 1-800-561-5611
E-mail: mail@greystoneenergy.com



DUCT

Duct Sensor, Thermistor

The ACI Thermistor Duct Series features a stainless steel probe with two, 22 AWG Etched Teflon colored lead wires to differentiate the different sensor types. The sensors in this series are manufactured using ACI's proved double encapsulation process to eliminate the effects of moisture on the sensors and increased response times from our high quality, thermally conductive epoxy. The duct sensor is designed to be used in smaller duct applications and includes an insulation pad for sealing your duct and dampening vibration. The sensor length should be determined by the width or diameter of your duct such that the tip of the probe reaches the approximate center of the duct. Our standard enclosure options are the galvanized enclosure "-GD" or plastic duct enclosure with hinged cover "-PB". On larger ducts, you may want to refer to our Rigid or Bendable Copper Averaging sensor for increased sensing points and better temperature control. This series can be ordered with optional NEMA/IP rated weather proof enclosures and NIST certificates as referenced on the back of the product data sheet.

Applications: Roof Top Units, Air Handlers, Supply/Discharge/Return/Mixed Air Temperatures

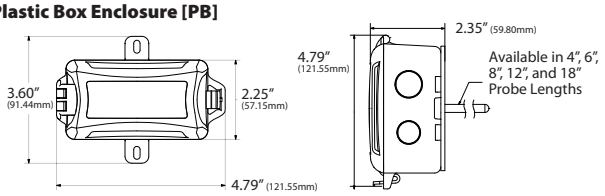
The ACI Thermistor Duct Series is covered by ACI's Five (5) Year Limited Warranty. The warranty can be found in the front of ACI's Sensors & Transmitters catalog, as well as on ACI's website, www.workaci.com.

PRODUCT SPECIFICATIONS

Sensor Type | Sensor Curve:	Thermistor | Non-Linear, NTC (Negative Temperature Coefficient)	
Number Sensing Points | Number Wires:	One | Two (Non-Polarity Sensitive)	
Sensor Output @ 25°C (77°F) |	**A/1.8K:** 1.8KΩ nominal | (Red/Yellow)	**A/CSI:** 10KΩ nominal | (Green/Yellow)
(Lead Wire Colors):	**A/3K:** 3KΩ nominal | (White/Brown)	**A/10KS:** 10KΩ nominal | (White/Blue)
	A/AN (Type III): 10KΩ nominal | (White/White)	**A/10K-E1:** 10KΩ nominal | (Gray/Orange)
	A/AN-BC: 5.238KΩ nominal | (White/Yellow)	**A/20K:** 20KΩ nominal | (Brown/Blue)
	A/CP (Type II): 10KΩ nominal | (White/Green)	**A/100KS:** 100KΩ nominal | (Black/Yellow)
Sensor Accuracy 0-70°C (32-158°F):	+/-0.2°C (+/-0.36°F) except **A/10K-E1 Series:** +/-0.3°C (+/-0.54°F)	
	A/1.8K Series: +/- 0.5°C @ 25°C (77°F) and (+/-1.0°C) (+/-1.8°F)	
Power Dissipation Constant:	3 mW/°C except **A/1.8K Series:** 1 mW/°C | **A/10K-E1 Series:** 2 mW/°C	
Stability:	Sensor Dependent; Contact ACI for more information on specific sensor	
Response Time (63% Step Change):	10 Seconds nominal	
Sensor Operating Temperature Range:	-40°C (-40°F) to 150°C (302°F)	
Enclosure Specifications (Temperature,	**"-GD" Enclosure:** Galvanized Steel, -40 to 115°C (-40 to 239°F), NEMA 1 (IP10)	
Material, Flammability, NEMA/IP Ratings):	**"-PB" Enclosure:** ABS Plastic, UL94-HB, -30 to 90°C (-22 to 194°F), Plenum Rated	
	"-BB" Enclosure: Aluminum, -40 to 121°C (-40 to 250°F), Plenum Rated, NEMA 3R	
	"-4X" Enclosure: Polystyrene Plastic, UL94-V2, -40 to 70°C (-40 to 158°F), NEMA 4X (IP 66)	
Storage Temperature Range:	-40 to 85°C (-40 to 185°F)	
Operating Humidity Range:	10 to 95% RH, non-condensing	
Probe Material | Probe Diameter:	304 Stainless Steel | 0.250" (6.35mm)	
Fitting Material | Flammability Rating:	Polyamide 66 (High Performance Nylon) | UL94-HB	
Foam Pad Material | Flammability Rating:	Neoprene/EPDM/SBR Polymer | UL94-HBF; FMVSS-302; MIL-R-6130C	
Lead Length | Conductor Size:	12" (30.5cm) | 22 AWG (0.65mm)	
Lead Wire Insulation | Wire Rating:	Etched Teflon (PTFE) Colored Leads | Mil Spec 16878/4 Type E)	
Conductor Material:	Silver Plated Copper	
Product Dimensions | Product Weight:	See table on back of Product Data sheet	
Agency Approvals:	CE, RoHS2, WEEE	

DIMENSIONAL DRAWING, WEIGHTS

Plastic Box Enclosure [PB]



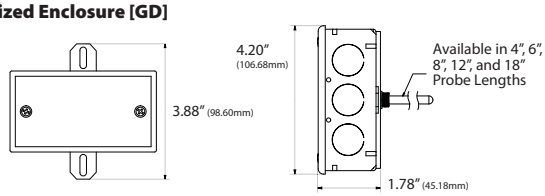
xx = Sensor Type | **yy** = Insertion Length

Plastic Box Enclosure [PB] Weights

ACI Model #	4" (Probe Length)	6" (Probe Length)	8" (Insertion Length)
A/xx-D-yy-PB	0.24 lbs. (0.109 kg)	0.25 lbs. (0.113 kg)	0.26 lbs. (0.117 kg)

ACI Model #	12" (Probe Length)	18" (Probe Length)
A/xx-D-yy-PB	0.28 lbs. (0.127 kg)	0.30 lbs. (0.136 kg)

Galvanized Enclosure [GD]

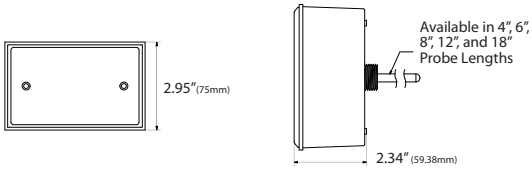


Galvanized Enclosure [GD] Weights

ACI Model #	4" (Probe Length)	6" (Probe Length)	8" (Insertion Length)
A/xx-D-yy-GD	0.66 lbs. (0.299 kg)	0.67 lbs. (0.303 kg)	0.68 lbs. (0.308 kg)

ACI Model #	12" (Probe Length)	18" (Probe Length)
A/xx-D-yy-GD	0.70 lbs. (0.317 kg)	0.74 lbs. (0.336 kg)

Bell Box Enclosure [BB]

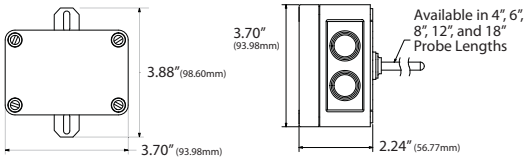


Bell Box Enclosure [BB] Weights

ACI Model #	4" (Probe Length)	6" (Probe Length)	8" (Insertion Length)
A/xx-D-yy-BB	0.70 lbs. (0.317 kg)	0.71 lbs. (0.322 kg)	0.72 lbs. (0.326 kg)

ACI Model #	12" (Probe Length)	18" (Probe Length)
A/xx-D-yy-BB	0.74 lbs. (0.336 kg)	0.78 lbs. (0.354 kg)

NEMA 4X Enclosure [4X]



NEMA 4X Enclosure [4X] Weights

ACI Model #	4" (Probe Length)	6" (Probe Length)	8" (Insertion Length)
A/xx-D-yy-4X	0.34 lbs. (0.154 kg)	0.35 lbs. (0.159 kg)	0.36 lbs. (0.163 kg)

ACI Model #	12" (Probe Length)	18" (Probe Length)
A/xx-D-yy-4X	0.38 lbs. (0.172 kg)	0.40 lbs. (0.181 kg)

Standard Views | **Product Weights**

CUSTOM ORDERING

Model # Example: A/ (A.) | 1.8K (B.) | D (C.) | 8" (D.) | GD (E.) | NIST (F.)

		MODEL #
A. Sensor Series *No Selection Required*	**A/** ⟶	A/
B. Model Series *Select One (1)*	**1.8K** | **3K** | **AN** | **AN-BC** | **CP** | **CSI** | **10KS** | **10K-E1** | **20K** | **100KS**	
C. Configuration *No Selection Required*	**D** = Duct ⟶	D
D. Probe Length *Select One (1)*	**4"** = 4" Probe | **6"** = 6" Probe | **8"** = 8" Probe | **12"** = 12" Probe | **18"** = 18" Probe	
E. Enclosure *Select One (1)*	**GD** = Galvanized | **PB** = Plastic | **BB** = Aluminum, NEMA 3R | **4X** = NEMA 4X	
F. NIST *Select One (1)*	**----** = No NIST Certificate | **NIST** = NIST Certificate (Must Specify 1, 3 or 5 Points)	

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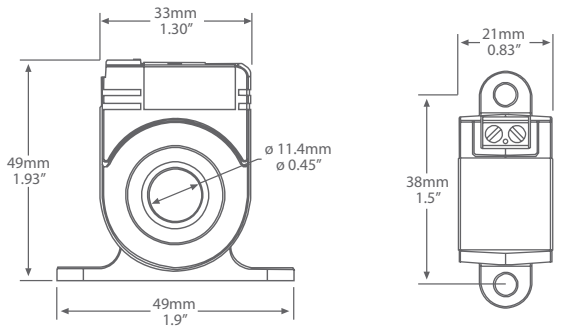
MINI CURRENT SENSOR



CS-650

PRODUCT DESCRIPTION

The CS-650 series of mini current sensors monitor line current for electrical loads such as pumps, conveyors, machine tools or fans and provide an output of 0-5 Vdc to represent the load current.

The CS-650 requires no external power supply as they are totally powered by induction of the AC line being monitored.

TYPICAL INSTALLATION

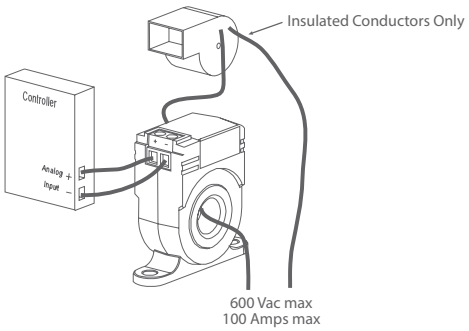
For complete installation and wiring details, please refer to the product installation instructions.

The CS-650 series must be mounted in an electrical enclosure and has an integral mounting tab to allow screw mount to a surface.

The CS-650 series has a 2 wire connection to the Building Automation System.

SPECIFICATIONS

MEASUREMENT RANGE	0-10, 20, or 50 Amps
MAXIMUM INPUT CURRENT	100 Amps continuous
ACCURACY	±1% FSO (5-100% of range)
SIGNAL OUTPUT	0-5 Vdc
SENSOR POWER	Self-powered
INSULATION CLASS	600 Vac, insulated conductors
FREQUENCY	50/60 Hz
RESPONSE TIME	250 mS typical, 0-95%
OUTPUT LOAD	1 MΩ typical
LOADING ERROR	Add 1.2% error with 100KΩ
OPERATING TEMPERATURE	-15 to 60°C (5 to 140°F)
OPERATING HUMIDITY	5 to 90 %RH non-condensing
TERMINAL BLOCK	14 to 22 AWG
DIMENSIONS	48mm W x 49mm H x 21mm D (1.9" x 1.93" x 0.83")
SENSOR APERTURE	11.4mm (0.45")
ENCLOSURE MATERIAL	ABS/PC, UL94-V0
AGENCY APPROVALS	cULus listed



ORDERING

PRODUCT	**CS-650**	Mini Solid-Core Current Sensor, 0-5 Vdc Output
SENSING RANGE	**10**	0-10 Amps
	20	0-20 Amps
	50	0-50 Amps

PART NUMBER

CS-650

NOTE: Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

RoHS COMPLIANT

Greystone Energy Systems, Inc.
150 English Drive, Moncton,
New Brunswick, Canada E1E 4G7

Ph: +1 (506) 853-3057 Fax: +1 (506) 853-6014
North America: 1-800-561-5611
E-mail: mail@greystoneenergy.com

TECHNICAL DATASHEET

Chrome DIN Rail Power Supply

24V 30W 1 Phase (Class II & NEC Class 2) / DRC-24V30W1AZ

CHROME

Highlights & Features

- Protection Class II, Double Isolation (No Earth connection is required)
- Universal AC input voltage and full power up to 55°C
- Power will not de-rate for the entire input voltage range
- Efficiency > 87.0% @ 115Vac & 230Vac
- NEC Class 2 / Limited Power Source (LPS) certified
- Overvoltage / Overcurrent / Over Temperature Protections

Safety Standards

CB Certified for worldwide use

Model Number: DRC-24V30W1AZ
Unit Weight: 0.14 kg
Dimensions (L x W x D): 91 x 53 x 55.6 mm

General Description

The DRC-24V30W1AZ is part of the Chrome DIN Rail Power Supply series, which is designed for use in compact cabinets for home automations and the food and beverage industry. Delta's Chrome DIN Rail Power Supply series offers double isolated input. This means that no Earth connection is required thus resulting in low leakage current. This product provides a universal input voltage range of 90-264Vac, and a wide temperature range of -25°C to 71°C. The Chrome series is certified to safety standard according to IEC/EN/UL 60950-1 Information Technology Equipment (ITE) and UL 508 Industrial Control Equipment (ICE). The series is also fully compliant with RoHS Directive 2011/65/EU for environmental protection. NEC Class 2 and Limited Power Source (LPS) approvals are available for this product.

Model Information

Chrome DIN Rail Power Supply

Model Number	Input Voltage Range	Output Voltage	Output Current
DRC-24V30W1AZ	90-264Vac (125-375Vdc)	24Vdc	1.25A

Model Numbering

DR	C –	24V	30W	1	A	Z
DIN Rail	Isolation Class II Power Supply	Output Voltage	Output Power	Single Phase	Chrome Series	Plastic Case

All parameters are specified at 25°C ambient unless otherwise indicated.
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DELTA

Chrome DIN Rail Power Supply

24V 30W 1 Phase (Class II & NEC Class 2) / DRC-24V30W1AZ

Specifications

Input Ratings / Characteristics

Nominal Input Voltage	100-240Vac
Input Voltage Range	90-264Vac
Nominal Input Frequency	50-60Hz
Input Frequency Range	47-63Hz
Nominal DC Input Voltage*	125-375Vdc
Input Current	< 0.80A @ 115Vac, < 0.60A @ 230Vac
Efficiency at 100% Load	> 87.0% @ 115Vac & 230Vac
Max Inrush Current (Cold Start)	< 25A @ 115Vac, < 50A @ 230Vac
Leakage Current	< 0.25mA @ 240Vac

*DC input voltage is not included in the UL safety approval. Additional testing might be necessary.

Output Ratings / Characteristics

Nominal Output Voltage	24Vdc
Output Voltage Tolerance	± 2% (initial set point tolerance from factory)
Output Voltage Adjustment Range	23.52-24.48Vdc
Output Current	1.25A
Output Power	30W
Line Regulation	< 1% typ. (@ 90-264Vac, 100% load)
Load Regulation	< 2% typ. (@ 90-264Vac, 100% load)
PARD (20MHz)	150mVpp
Rise Time	< 100ms @ nominal input (100% load)
Start-up Time	< 3,000ms @ nominal input (100% load)
Hold-up Time	> 25ms @ 115Vac, > 30ms @ 230Vac (100% load)
Dynamic Response (Overshoot & Undershoot O/P Voltage)	± 5% @ 10-100% load
Start-up with Capacitive Loads	3,000μF Max

Mechanical

Case Cover		Plastic
Dimensions (L x W x D)		91 x 53 x 55.6 mm
Unit Weight		0.14 kg
Indicator		Green LED (DC OK)
Cooling System		Convection
Terminal	Input	2 Pins (Rated 300V/25A)
	Output	4 Pins (Rated 300V/25A)
Wire	Input / Output	AWG 24-12
Mounting Rail		Standard TS35 DIN Rail in accordance with EN 60715
Noise (1 Meter from power supply)		Sound Pressure Level (SPL) < 25dBA

Chrome DIN Rail Power Supply

24V 30W 1 Phase (Class II & NEC Class 2) / DRC-24V30W1AZ

Environment

Surrounding Air Temperature	Operating	-25°C to +71°C
	Storage	-25°C to +85°C
Power De-rating		> 55°C de-rate power by 2.5% / °C
Operating Humidity		5 to 95% RH (Non-Condensing)
Operating Altitude		0 to 2,000 Meters
Shock Test (Operating)		IEC 60068-2-27, Half Sine Wave: 4G for a duration of 22ms, 3 shocks for each 3 directions, 9 times in total
Vibration (Operating)		IEC 60068-2-6, Sine Wave: 10-500Hz @ 19.6m/S² (2G peak); 10 min per cycle, 60 min for all X, Y, Z directions
Pollution Degree		2

Protections

Overvoltage	< 34.8V, SELV Output, Latch-off Mode
Overload / Overcurrent	> 130% of rated load current, Hiccup Mode, Non-Latching (Auto-Recovery when the fault is removed)
Over Temperature	> 75°C Surrounding Air Temperature @ 100% load, Latch-off Mode
Short Circuit	Hiccup Mode, Non-Latching (Auto-Recovery when the fault is removed)
Degree of Protection	IP20
Protection Against Shock	Class II (No PE* connection is required)

*PE: Primary Earth

Reliability Data

MTBF	> 500,000 hrs. as per Telcordia SR-332 I/P: 100Vac, O/P: 100% load, Ta: 35°C
Expected Cap Life Time	10 years (115Vac & 230Vac, 50% load @ 40°C)

Chrome DIN Rail Power Supply

24V 30W 1 Phase (Class II & NEC Class 2) / DRC-24V30W1AZ

Safety Standards / Directives

Electrical Safety		TUV Bauart to EN 60950-1, UL/cUL recognized to UL 60950-1, CSA C22.2 No. 60950-1, CB scheme to IEC 60950-1, Limited Power Source (LPS)
Industrial Control Equipment		UL/cUL listed to UL 508 and CSA C22.2 No. 107.1-01
Class 2 Power Supply		UL/cUL recognized to UL 60950-1, CSA C22.2 No. 60950-1
CE		In conformance with EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC
Material and Parts		RoHS Directive 2011/65/EU Compliant
Galvanic Isolation	Input to Output	3.0KVac

EMC

EMC / Emissions		CISPR 22, EN 55022, FCC Title 47: Class A*
Immunity to		EN 55024
Electrostatic Discharge	IEC 61000-4-2	Level 3 Criteria A[1)] Air Discharge: 8kV Contact Discharge: 4kV
Radiated Field	IEC 61000-4-3	Level 2 Criteria A[1)] 80MHz-1GHz, 3V/M with 1kHz tone / 80% modulation
Electrical Fast Transient / Burst	IEC 61000-4-4	Level 3 Criteria A[1)] 1kV
Surge	IEC 61000-4-5	Level 3 Criteria A[1)] Common Mode[2)]: 2kV Differential Mode[3)]: 1kV
Conducted	IEC 61000-4-6	Level 2 Criteria A[1)] 150kHz-80MHz, 3Vrms
Power Frequency Magnetic Fields	IEC 61000-4-8	Criteria A[1)] 1A/Meter
Voltage Dips	IEC 61000-4-11	> 95% dip; 0.5 cycle (10ms)
Voltage Fluctuation and Flicker		IEC/EN 61000-3-3

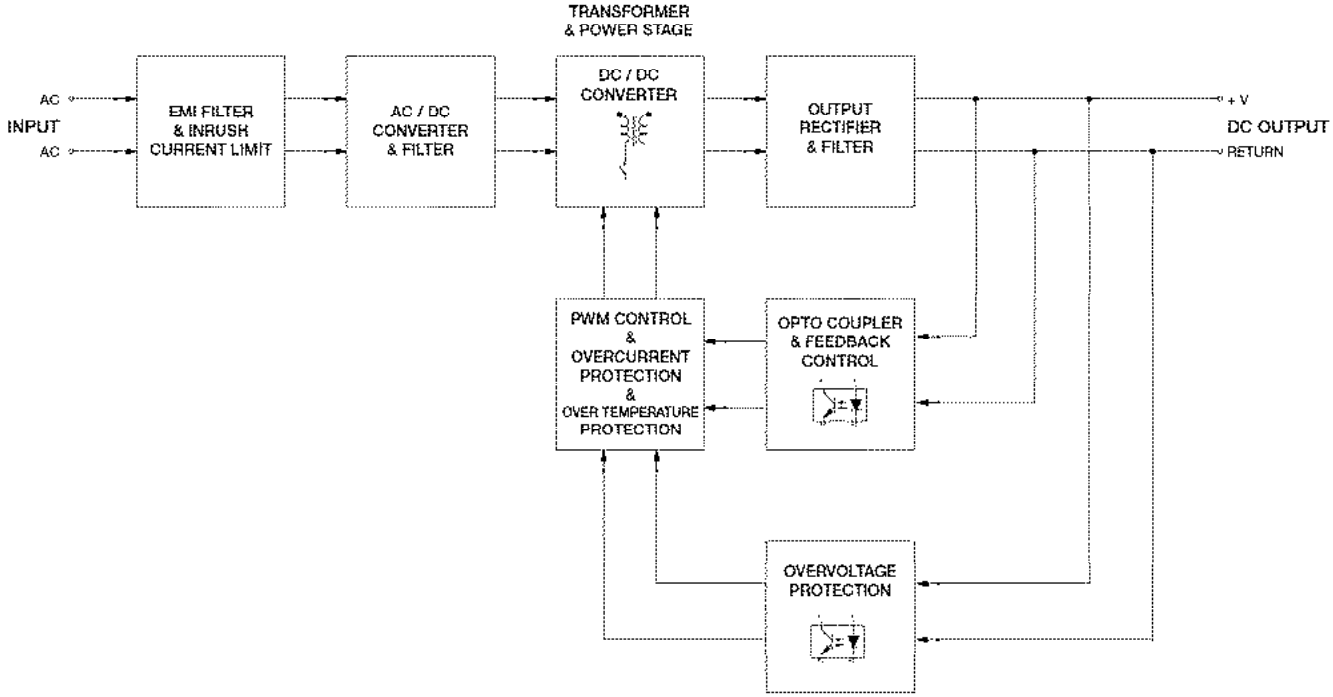
1) Criteria A: Normal performance within the specification limits
2) Asymmetrical: Common mode (Line to earth)
3) Symmetrical: Differential mode (Line to line)

*Warning: This is a Class A product. In a residential, commercial or light industrial environment it may cause radio interference. This product is not intended to be installed in a residential environment; in a commercial and light industrial environment with connection to the public mains supply, the user may be required to take adequate measures to reduce interference.

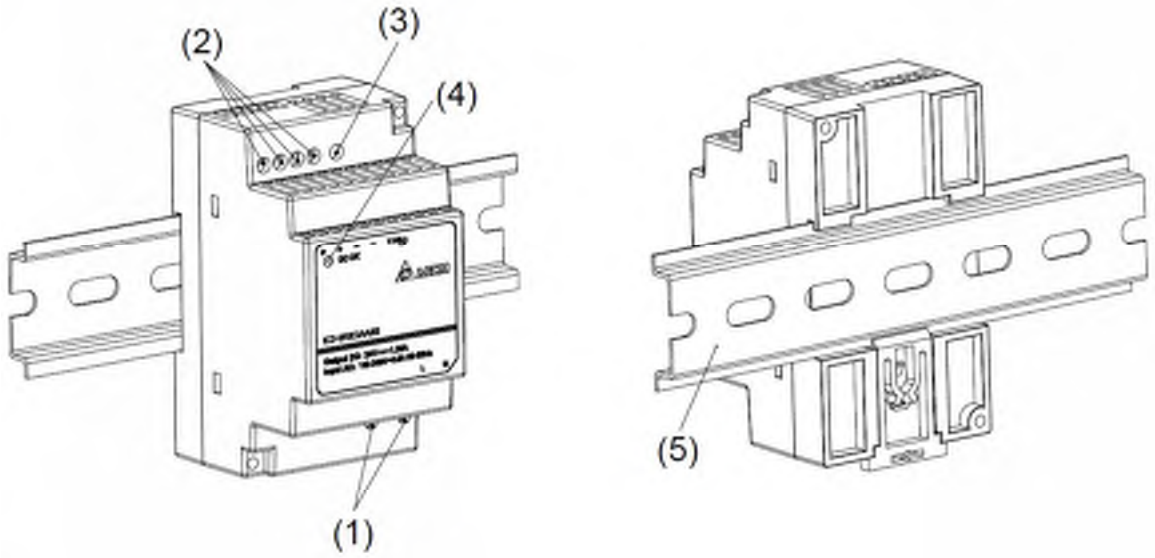
Chrome DIN Rail Power Supply

24V 30W 1 Phase (Class II & NEC Class 2) / DRC-24V30W1AZ

Block Diagram



Device Description



1) Input terminal block connector
2) Output terminal block connector
3) DC voltage adjustment potentiometer
4) DC OK control LED (Green)
5) Universal mounting system

All parameters are specified at 25°C ambient unless otherwise indicated.
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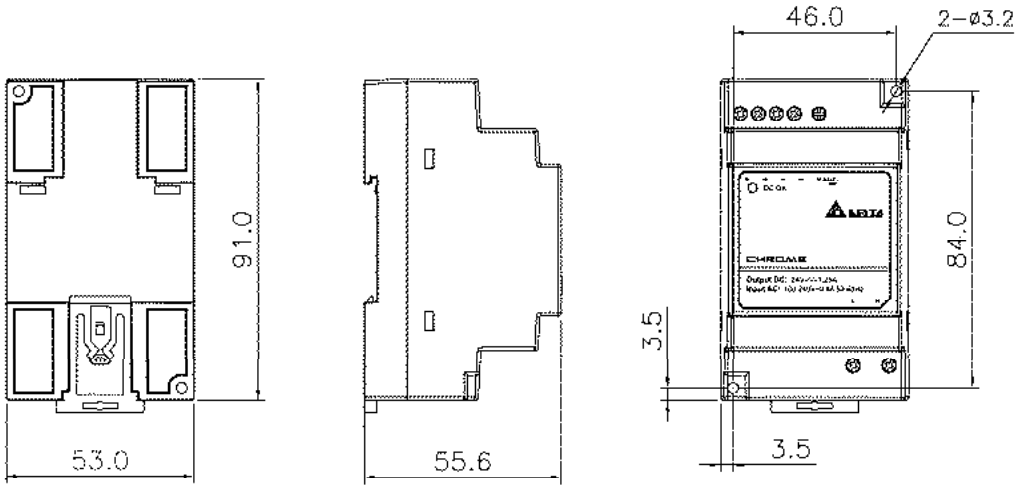
Chrome DIN Rail Power Supply

24V 30W 1 Phase (Class II & NEC Class 2) / DRC-24V30W1AZ

Dimensions

L x W x D: 91 x 53 x 55.6 mm



Engineering Data

De-rating

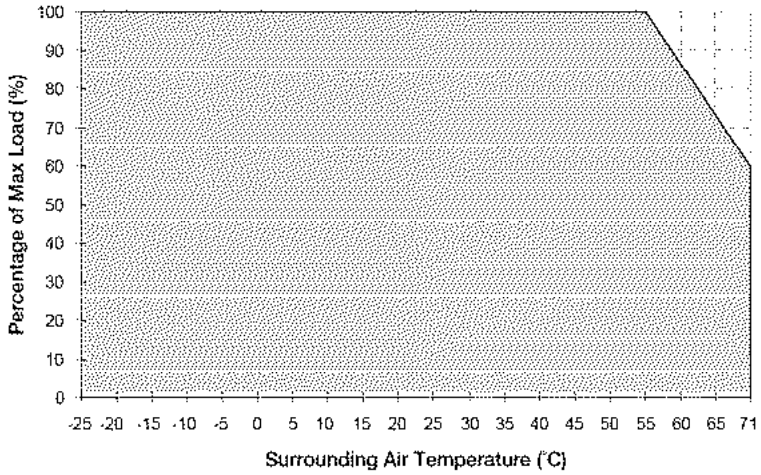


Fig. 1 De-rating for Vertical Mounting Orientation
> 55°C de-rate power by 2.5% / °C

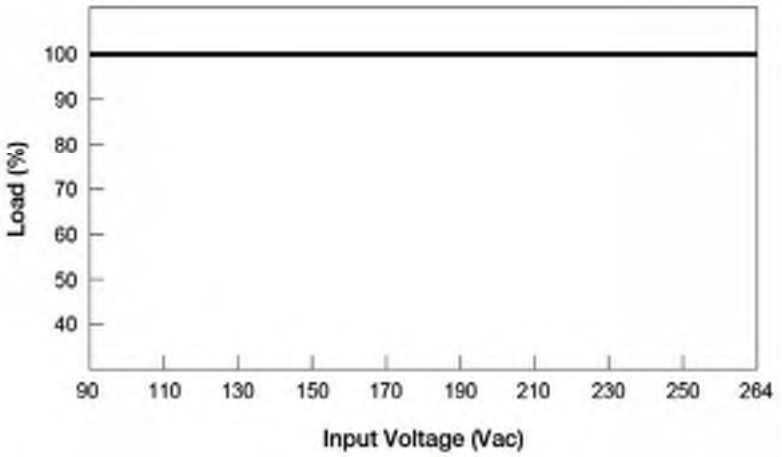
Note

1. Power supply components may degrade, or be damaged, when the power supply is continuously used outside the shaded region, refer to the graph shown in Fig. 1.
2. If the output capacity is not reduced when the surrounding air temperature >55°C, the device may run into Over Temperature Protection. When activated, the output voltage will go into latch-off mode and recoverable by AC power recycle.
3. In order for the device to function in the manner intended, it is also necessary to keep a safety distance of 25mm with adjacent units while the device is in operation.
4. Depending on the surrounding air temperature and output load delivered by the power supply, the device can be very hot!
5. If the device has to be mounted in any other orientation, please do not hesitate to contact **info@deltapsu.com** for more details.

Chrome DIN Rail Power Supply

24V 30W 1 Phase (Class II & NEC Class 2) / DRC-24V30W1AZ

Output De-rating VS. Input Voltage



- No output power de-rating across the entire input voltage range

Assembly & Installation

The power supply unit (PSU) can be mounted on 35mm DIN rails in accordance with EN60715. The device should be installed with input terminal block at the bottom.

Each device is delivered ready to install.

Mounting

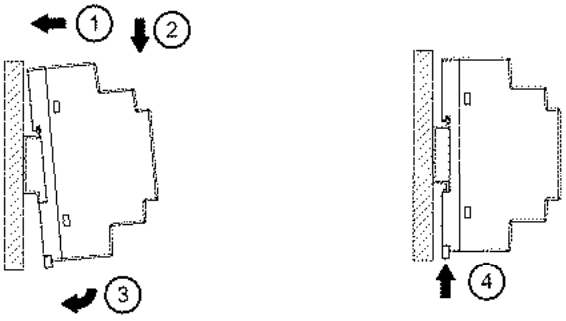


Fig. 2.1 Mounting

Snap on the DIN rail as shown in Fig. 2.1:

1. Tilt the unit upwards and insert it onto the DIN rail.
2. Push downwards until stopped.
3. Press against the bottom front side for locking.
4. Shake the unit slightly to ensure that it is secured.

Dismounting

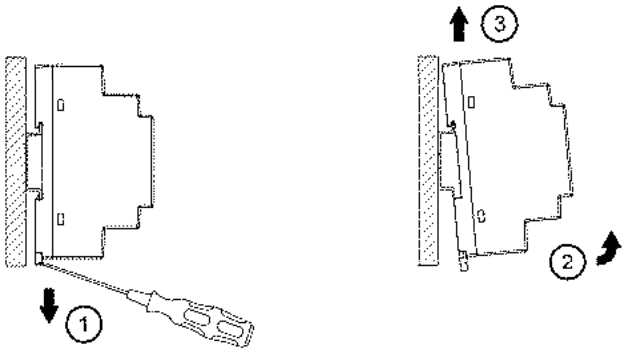


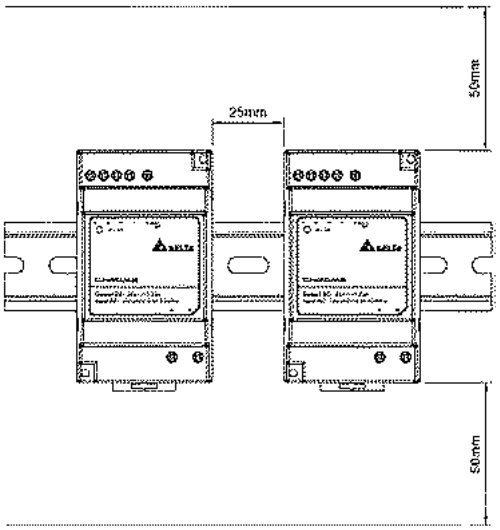
Fig. 2.2 Dismounting

To uninstall, pull or slide down the latch with screw driver as shown in Fig. 2.2. Then slide the power supply unit (PSU) in the opposite direction, release the latch and pull out the power supply unit (PSU) from the rail.

Chrome DIN Rail Power Supply

24V 30W 1 Phase (Class II & NEC Class 2) / DRC-24V30W1AZ

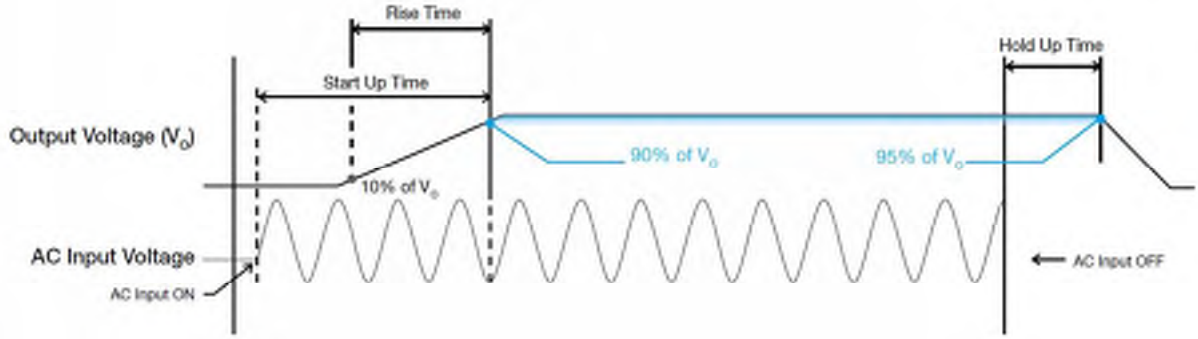
Safety Instructions



- ALWAYS switch mains of input power OFF before connecting and disconnecting the input voltage to the unit. If mains are not turned OFF, there is risk of explosion / severe damage.
- **To guarantee sufficient convection cooling, keep a distance of 50mm above and below the device as well as a lateral distance of 25mm to other units.**
- Note that the enclosure of the device can become very hot depending on the surrounding air temperature and load of the power supply. Risk of burns!
- DO NOT insert any objects into the unit.
- Hazardous voltages may be present for up to 5 minutes after the input mains voltage is disconnected. Do not touch the unit during this time.
- The power supplies unit should be installed in minimum IP54 rated enclosure.
- The power supplies are built in units and must be installed in a cabinet or room (condensation free environment and indoor location) that is relatively free of conductive contaminants.

Functions

■ **Graph illustrating the Start-up Time, Rise Time, and Hold-up Time**



Start-up Time

The time required for the output voltage to reach 90% of its set value, after the input voltage is applied.

Rise Time

The time required for the output voltage to change from 10% to 90% of its set value.

Hold-up Time

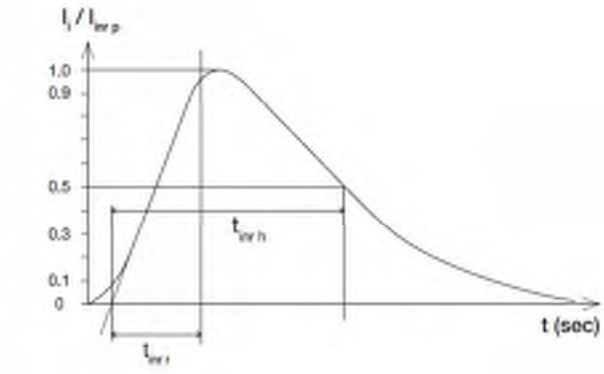
Hold up time is the time when the AC input collapses and output voltage retains regulation for a certain period of time. The time required for the output to reach 90% of its set value, after the input voltage is removed.

Chrome DIN Rail Power Supply

24V 30W 1 Phase (Class II & NEC Class 2) / DRC-24V30W1AZ

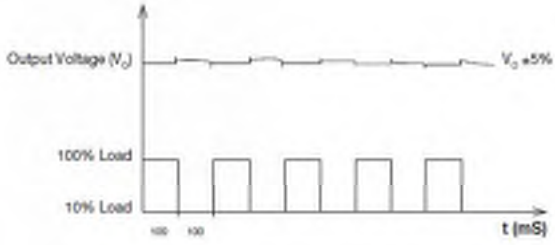
Inrush Current

Inrush current is the peak, instantaneous, input current measured and, occurs when the input voltage is first applied. For AC input voltages, the maximum peak value of inrush current will occur during the first half cycle of the applied AC voltage. This peak value decreases exponentially during subsequent cycles of AC voltage.



Dynamic Response

The power supply output voltage will remains within ±5% of its steady state value, when subjected to a dynamic load from 10 to 100% of its rated current.

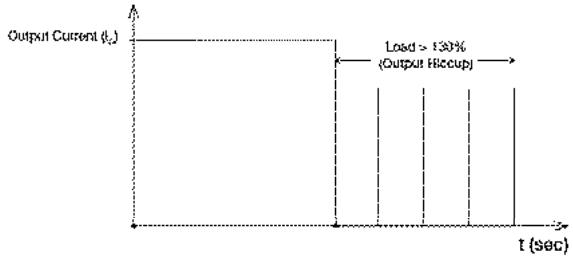


Overvoltage Protection

The power supply's overvoltage circuit will be activated when its internal feedback circuit fails. The output voltage shall not exceed its specifications defined on Page 3 under "Protections".

Overload & Overcurrent Protections

The power supply's Overload (OLP) and Over current (OCP) Protections will be activated when output current exceeds 130% of I_O (Max load). In such occurrence, once the power supply has reached its maximum power limit, the protection is activated and the power supply will go into "Hiccup mode" (Auto-Recovery). The power supply will recover once the fault condition of the OLP and OCP is removed and I_O is back within the specifications.



Over Temperature Protection

As mentioned above, the power supply also has Over Temperature Protection (OTP). In the event of a higher operating temperature at 100% load, the power supply will run into OTP when the operating temperature is beyond what is recommended in the de-rating graph. When activated, the output voltage will go into latch-off mode until the component temperature cools down and the AC power is recycled.

Short Circuit Protection

The power supply's output OLP/OCP function also provides protection against short circuits. When a short circuit is applied, the output current will operate in "Hiccup mode", as shown in the illustration in the OLP/OCP section on this page. The power supply will return to normal operation after the short circuit is removed.

Chrome DIN Rail Power Supply

24V 30W 1 Phase (Class II & NEC Class 2) / DRC-24V30W1AZ

Operating Mode

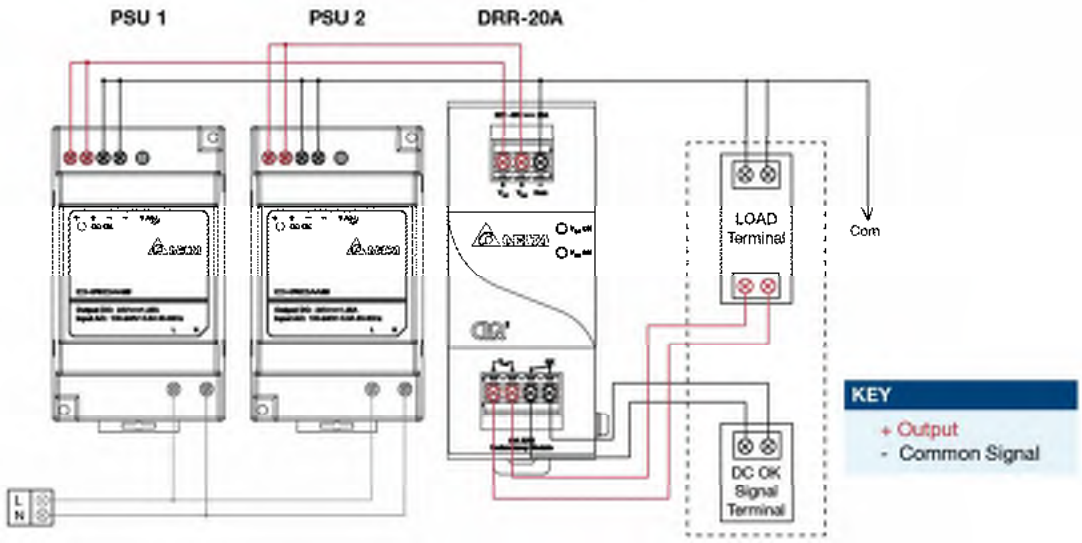


Fig. 3 Redundancy / Parallel Operation Connection Diagram

■ **Redundancy Operation**

In order to ensure proper redundancy operation for the power supply unit (PSU), ensure that the output voltage difference between the two units is kept at 0.45~0.50V for 24V supplies. Follow simple steps given below to verify:

Step 1.
Measure output voltage of PSU 1 and PSU 2. If PSU 1 is the master unit, then V_O of PSU 1 must be higher than PSU 2. In order to set the output voltage, connect the power supply to 50% load and set the PSU 1 and PSU 2 output voltage.

Step 2.
Connect the right DRR module, 20A as per the system requirement to the power supply units PSU 1 and PSU 2 at V_{in} 1 & V_{in} 2 respectively.

Step 3.
Connect the system load from V_{out}. Please note that output voltage V_{out} from DRR module will be = V_O (output voltage of power supply) – V_{drop}* (in DRR module).

■ **Parallel Operation**

These DRR modules can also be used for Parallel function in order to increase the output power by N+1 (e.g. 2.5A + 2.5A = 5A or 2.5A + 2.5A + 2.5A = 7.5A) or current sharing, and thus increasing the power supply and system reliability. Though the DRC-24V30W1AZ is not designed for current sharing, a good current sharing between two power supplies can be achieved by following simple steps as below (Refer to Fig. 3 for the Connection Diagram).

Step 1.
Set output load condition for both supplies at 50% and measure the output voltages.

Step 2.
Adjust output voltages to the same level or within ±25mV difference.

Step 3.
Connect PSU 1 and PSU 2 with the DRR-20A module and measure at V_{in} 1 & V_{in} 2 to verify the voltage difference. Ensure the voltages are within ±25mV.

Step 4.
Output voltage from DRR module V_{out} will be = V_O (output voltage of power supply) – V_{drop}* (in DRR module).

*V_{drop} will vary from 0.60V to 0.90V (Typical 0.65V) depending on the load current and surrounding air temperature.

Chrome DIN Rail Power Supply

24V 30W 1 Phase (Class II & NEC Class 2) / DRC-24V30W1AZ

Others

Delta RoHS Compliant

Restriction of the usage of hazardous substances

The European directive 2011/65/EU limits the maximum impurity level of homogeneous materials such as lead, mercury, cadmium, chrome, polybrominated flame retardants PBB and PBDE for the use in electrical and electronic equipment. RoHS is the abbreviation for “Restriction of the use of certain hazardous substances in electrical and electronic equipment”.

This product conforms to this standard.

BELIMO

Technical data sheet Z2050Q-J

ZoneTight™, 2-way, Internal thread

- For closed cold and warm water systems
- For switching functions and 2-point controls on the water side of air-handling units and heating systems
- Snap-assembly of the actuator

5-year warranty

Type overview

Type	DN
Z2050Q-J	15

Technical data

Functional data	Valve size [mm]	0.5" [15]
	Fluid	chilled or hot water, up to 60% glycol
	Fluid Temp Range (water)	36...212°F [2...100°C]
	Body Pressure Rating	360 psi
	Close-off pressure Δps	75 psi
	Differential pressure Δpmax	40kPa
	Flow characteristic	equal percentage
	Angle of rotation note	Operating range 15...90°
	Installation position	upright to horizontal (in relation to the stem)
	Servicing	maintenance-free
	Flow Pattern	2-way
	Leakage rate	0%
	Controllable flow range	75°
	Cv	5.9
Materials	Valve body	forged brass
	Stem	brass
	Stem seal	EPDM O-ring
	Seat	PTFE, O-Ring EPDM
	Seat	PTFE
	Pipe connection	NPT
	O-ring	EPDM (lubricated)
	Ball	chrome plated brass
Suitable actuators	Non-Spring	CQB
	Electrical fail-safe	CQKB(X)

Safety notes

- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.p65warnings.ca.gov
- If temperature exceeds 212°F operating range due to a boiler control failure the valve will safely contain the hot water but manufacturers product warranty becomes invalid. Valve and actuator replacement is at the expense of others.

Product features

Application

The QCV zone valves are suited for large commercial buildings where higher close-off and the ability to change flow is desired. Common applications include unit ventilators, fan coil units, VAV reheat coils, fin tube casing, radiant panels and duct coils. The valve fits in space restricted areas and can be assembled without the use of tools.

Mode of operation

The ball valve is adjusted by a rotary actuator. The rotary actuator is controlled by an on/off signal or by a commercially available modulating or floating point control system and moves the ball of the ball valve – the throttling device – to the position preset by the control signal. Open the ball valve is carried out counterclockwise and close it clockwise.

Simple direct mounting

Tool-free snap assembly.

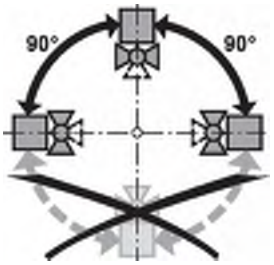
The actuator can be plugged on the valve by hand (Caution! Just vertical movements). Pins must match the holes on the flange.

The mounting orientation in relation to the valve can be selected in 180° increments. (Possible two times)

Installation notes

Recommended installation positions

The ball valve can be installed upright to horizontal. The ball valve may not be installed in a hanging position, i.e. with the stem pointing downwards.



Water quality requirements

Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work). The installation of a suitable strainer is recommended.

Servicing

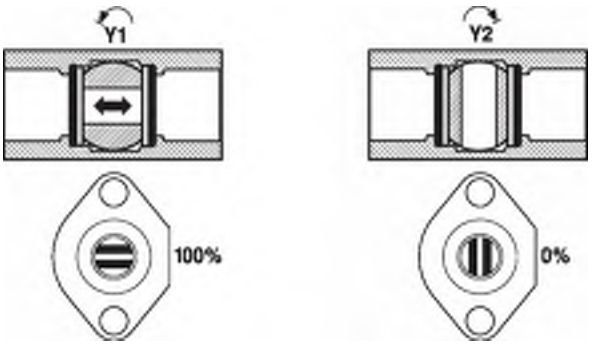
Ball valves and rotary actuators are maintenance-free.

Before any service work on the control element is carried out, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable if necessary). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow all components to cool down first if necessary and always reduce the system pressure to ambient pressure level).

The system must not be returned to service until the ball valve and the rotary actuator have been correctly reassembled in accordance with the instructions and the pipeline has been refilled by professionally trained personnel.

Flow direction

Direction of flow in both directions possible.



Flow setting The angle of rotation of the actuator can be changed by a clip in 2.5° increments. This is used to set the kvs value (maximum flow rate of the valve).

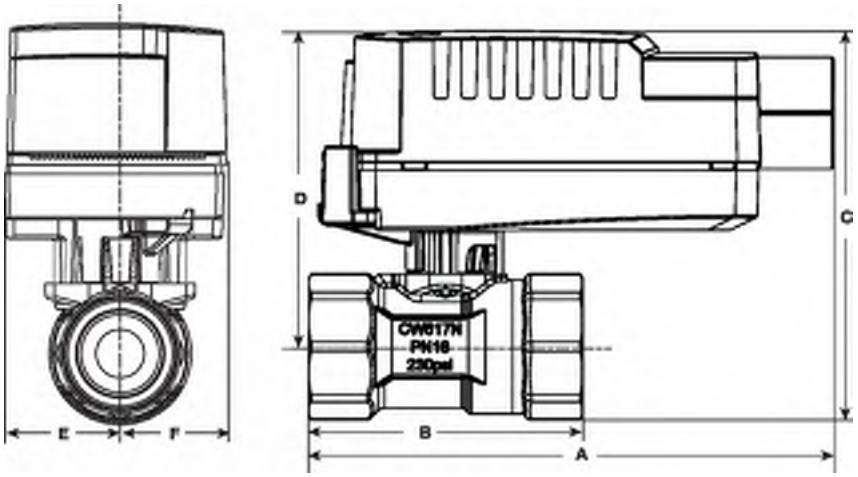
Remove end stop clip and place at desired position.

After every change of the flow setting by means of end stop clip, an adaptation must be triggered on the modulating actuators.

Dimensions

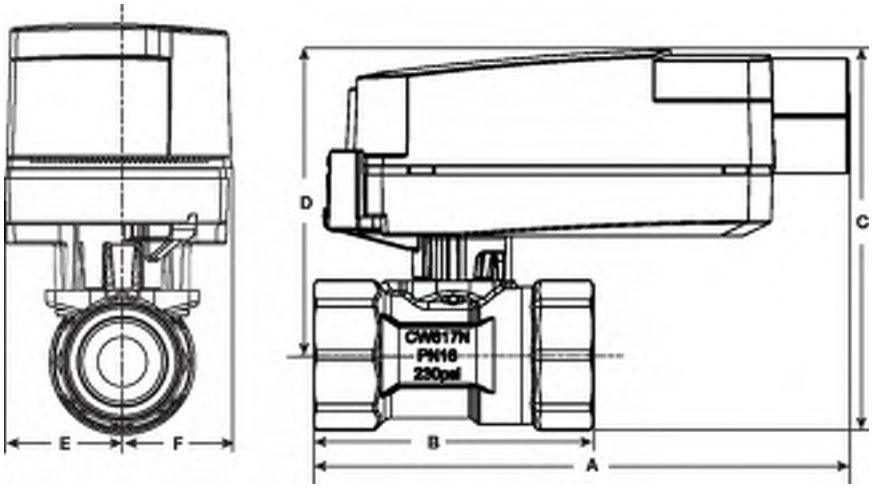
Type	DN	Weight
Z2050Q-J	15	0.22 lb [0.10 kg]

CQK



A	B	C	D	E	F
4.5" [114]	2.0" [52]	3.3" [83]	2.7" [69]	0.9" [24]	0.9" [24]

CQ



A	B	C	D	E	F
4.5" [114]	2.0" [52]	3.1" [80]	2.6" [65]	1.0" [25]	1.0" [26]

BELIMO

Modulating, Non-Spring Return, 24 V, DC 2 V (Close) DC 10 V (Open) or 4...20 mA

- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V

Technical data sheet CQB24-SR-R

5-year warranty

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	0.3 W
	Power consumption in rest position	0.3 W
	Transformer sizing	1 VA
	Electrical Connection	18 GA plenum cable, 3 ft [1 m], with 1/2" conduit connector
	Overload Protection	electronic thoughout 0...90° rotation
	Electrical Protection	actuators are double insulated
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Position feedback U	2...10 V
	Angle of rotation	90°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	75 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	pointer
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02 CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	2...40°C
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
Weight	Weight	0.55 lb [0.20 kg]
Materials	Housing material	UL94-5VA

Product features

Application

Non-Fail Safe proportional ZoneTight actuator.

Valve selection should be done in accordance with the flow parameters and system specifications.

The actuator is mounted directly to the valve without the need for tools or additional linkage.

The actuator operates in response to a 2...10 V or 4...20 mA control signal.

Electrical installation

INSTALLATION NOTES

2 Actuators may be connected in parallel. Power consumption and input impedance must be observed.

3 Actuators may also be powered by DC 24 V.

5 Only connect common to negative (-) leg of control circuits.

7 A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.

18 Actuators with plenum cable do not have numbers; use color codes instead.

Meets cULus requirements without the need of an electrical ground connection.

Warning! Live electrical components!

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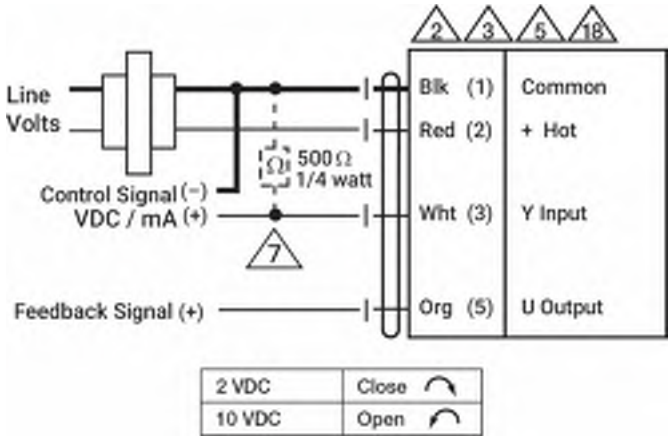
Wiring diagrams

AC 24 V Transformer



BELIMO

Modulating, Electrical Fail-Safe, 24 V, for DC 2...10 V or 4...20 mA Control Signal

- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V

Technical data sheet CQKB24-SR-LL

5-year warranty

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	2.5 W
	Power consumption in rest position	0.5 W
	Transformer sizing	5 VA
	Electrical Connection	22 GA plenum cable, 3 ft [1 m], with 1/2" conduit connector
	Overload Protection	electronic thoughout 0...90° rotation
	Electrical Protection	actuators are double insulated
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Position feedback U	2...10 V
	Bridging time (PF)	2 s
	Pre-charging time	5...20 s
	Angle of rotation	90°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	75 s / 90°
	Running time fail-safe	<60 s
	Noise level, motor	35 dB(A)
	Noise level, fail-safe	35 dB(A)
	Position indication	pointer
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02 CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	35...104°F [2...40°C]
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
Weight	Weight	0.55 lb [0.20 kg]
Materials	Housing material	UL94-5VA

Product features

Application Electrical fail-safe proportional ZoneTight actuator.

Valve selection should be done in accordance with the flow parameters and system specifications. The actuator is mounted directly to the valve without the need for tools or additional linkage.

The actuator operates in response to a 2...10 V or 4...20mA control signal.

Electrical installation

INSTALLATION NOTES

A Actuators with appliance cables are numbered.

2 Actuators may be connected in parallel. Power consumption and input impedance must be observed.

3 Actuators may also be powered by DC 24 V.

5 Only connect common to negative (-) leg of control circuits.

7 A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.

18 Actuators with plenum cable do not have numbers; use color codes instead.

Meets cULus requirements without the need of an electrical ground connection.

Warning! Live electrical components!

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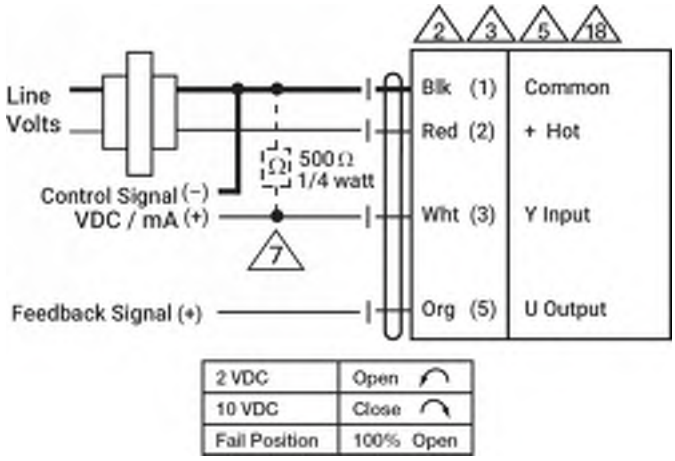
Wiring diagrams

AC 24 V Transformer



ZoneTight™, 2-way, Internal thread

- For closed cold and warm water systems
- For switching functions and 2-point controls on the water side of air-handling units and heating systems
- Snap-assembly of the actuator

5-year warranty

Type overview

Type	DN
Z2050Q-F	15

Technical data

Functional data	Valve size [mm]	0.5" [15]
	Fluid	chilled or hot water, up to 60% glycol
	Fluid Temp Range (water)	36...212°F [2...100°C]
	Body Pressure Rating	360 psi
	Close-off pressure Δps	75 psi
	Differential pressure Δpmax	40psi
	Flow characteristic	equal percentage
	Leakage rate	0%
	Angle of rotation note	Operating range 15...90°
	Pipe connection	Internal thread NPT (female)
	Installation orientation	upright to horizontal (in relation to the stem)
	Servicing	maintenance-free
	Flow Pattern	2-way
	Controllable flow range	75°
	Cv	1.4
Materials	Valve body	forged brass
	Stem	brass
	Stem seal	EPDM O-ring
	Seat	PTFE, O-Ring EPDM
	O-ring	EPDM (lubricated)
	Ball	chrome plated brass
Suitable actuators	Non Fail-Safe	CQB(X)
	Electrical fail-safe	CQKB(X)

Safety notes

- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.p65warnings.ca.gov
- If temperature exceeds 212°F operating range due to a boiler control failure the valve will safely contain the hot water but manufacturers product warranty becomes invalid. Valve and actuator replacement is at the expense of others.

Product features

Application

The QCV zone valves are suited for large commercial buildings where higher close-off and the ability to change flow is desired. Common applications include unit ventilators, fan coil units, VAV reheat coils, fin tube casing, radiant panels and duct coils. The valve fits in space restricted areas and can be assembled without the use of tools.

Operating mode

The ball valve is adjusted by a rotary actuator. The rotary actuator is controlled by an on/off signal or by a commercially available modulating or floating point control system and moves the ball of the ball valve – the throttling device – to the position preset by the control signal. Open the ball valve is carried out counterclockwise and close it clockwise.

Simple direct mounting

Tool-free snap assembly.

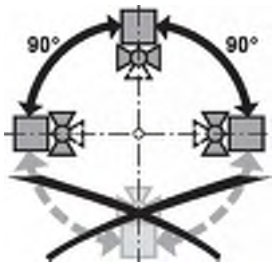
The actuator can be plugged on the valve by hand (Caution! Just vertical movements). Pins must match the holes on the flange.

The mounting orientation in relation to the valve can be selected in 180° increments. (Possible two times)

Installation notes

Permissible installation orientation

The ball valve can be installed upright to horizontal. The ball valve may not be installed in a hanging position, i.e. with the stem pointing downwards.



Water quality requirements

Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work). The installation of a suitable strainer is recommended.

Servicing

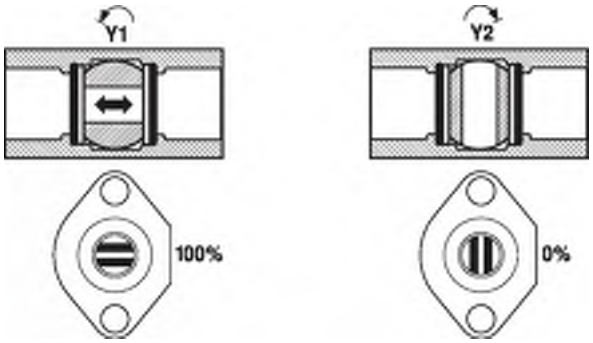
Ball valves and rotary actuators are maintenance-free.

Before any service work on the control element is carried out, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable if necessary). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow all components to cool down first if necessary and always reduce the system pressure to ambient pressure level).

The system must not be returned to service until the ball valve and the rotary actuator have been correctly reassembled in accordance with the instructions and the pipeline has been refilled by professionally trained personnel.

Flow direction

Direction of flow in both directions possible.



Installation notes

Flow setting

The angle of rotation of the actuator can be changed by a clip in 2.5° increments. This is used to set the kvs value (maximum flow rate of the valve).

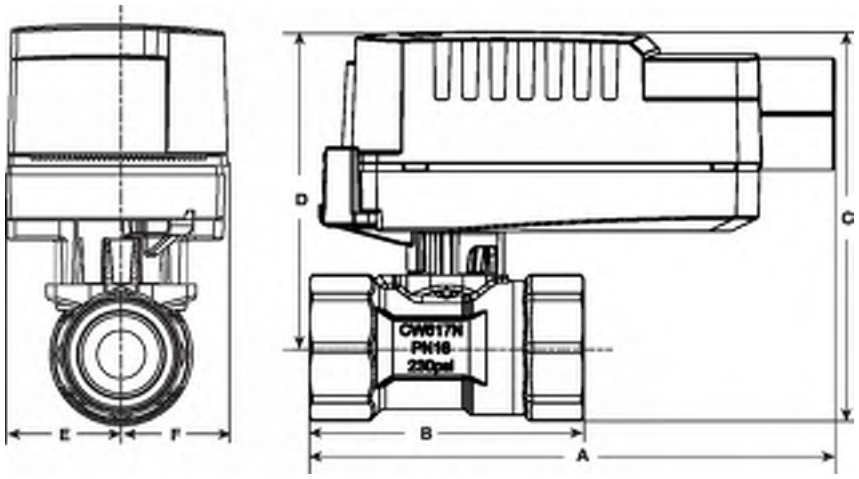
Remove end stop clip and place at desired position.

After every change of the flow setting by means of end stop clip, an adaptation must be triggered on the modulating actuators.

Dimensions

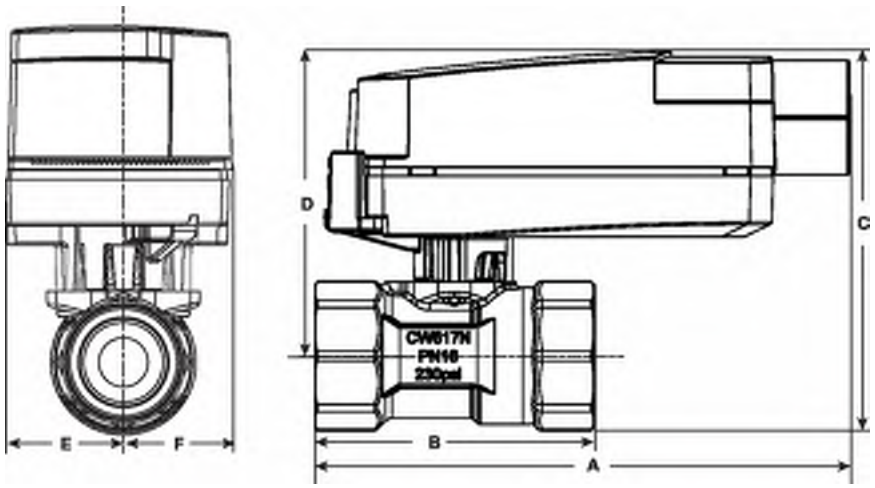
Type	DN	Weight
Z2050Q-F	15	0.15 lb [0.070 kg]

CQK



A	B	C	D	E	F
4.5" [114]	2.0" [52]	3.3" [83]	2.7" [69]	0.9" [24]	0.9" [24]

CQ



A	B	C	D	E	F
4.5" [114]	2.0" [52]	3.1" [80]	2.6" [65]	1.0" [25]	1.0" [26]

Modulating, Non fail-safe, 24 V

- Nominal voltage AC/DC 24 V
- Control Modulating 2...10 V

5-year warranty

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	0.3 W
	Power consumption in rest position	0.3 W
	Transformer sizing	1 VA
	Electrical Connection	22 GA plenum cable, 3 ft [1 m], with 1/2" NPT conduit connector
	Overload Protection	electronic thoughout 0...90° rotation
	Electrical Protection	actuators are double insulated
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Position feedback U	2...10 V
	Angle of rotation	90°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	75 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	pointer
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02 CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	35...104°F [2...40°C]
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
Weight	Weight	0.55 lb [0.25 kg]
Materials	Housing material	UL94-5VA

Technical data

Product features

Application Non-Fail Safe proportional ZoneTight actuator.

Valve selection should be in accordance with flow parameters and system specifications.

The actuator is mounted directly to the valve without the need for tools or additional linkage.

The actuator operated in response to a 2..10 V, 0.5...10 V, or 4...20 mA control signal.

Electrical installation

INSTALLATION NOTES

2 Actuators may be connected in parallel. Power consumption and input impedance must be observed.

3 Actuators may also be powered by DC 24 V.

5 Only connect common to negative (-) leg of control circuits.

7 A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.

18 Actuators with plenum cable do not have numbers; use color codes instead.

Meets cULus requirements without the need of an electrical ground connection.

Warning! Live electrical components!

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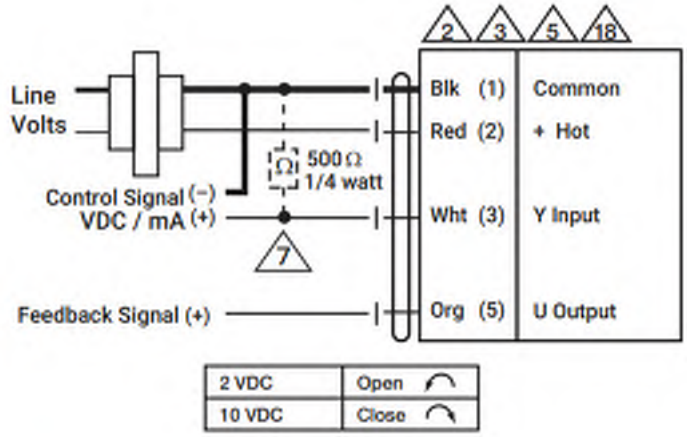
Wiring diagrams



BELIMO

Modulating, Non-Spring Return, 24 V, DC 2 V (Close) DC 10 V (Open) or 4...20 mA

- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V

Technical data sheet CQB24-SR-R

5-year warranty

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	0.3 W
	Power consumption in rest position	0.3 W
	Transformer sizing	1 VA
	Electrical Connection	18 GA plenum cable, 3 ft [1 m], with 1/2" conduit connector
	Overload Protection	electronic thoughout 0...90° rotation
	Electrical Protection	actuators are double insulated
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Position feedback U	2...10 V
	Angle of rotation	90°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	75 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	pointer
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02 CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	2...40°C
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
Weight	Weight	0.55 lb [0.20 kg]
Materials	Housing material	UL94-5VA

Product features

Application

Non-Fail Safe proportional ZoneTight actuator.

Valve selection should be done in accordance with the flow parameters and system specifications.

The actuator is mounted directly to the valve without the need for tools or additional linkage.

The actuator operates in response to a 2...10 V or 4...20 mA control signal.

Electrical installation

INSTALLATION NOTES

2 Actuators may be connected in parallel. Power consumption and input impedance must be observed.

3 Actuators may also be powered by DC 24 V.

5 Only connect common to negative (-) leg of control circuits.

7 A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.

18 Actuators with plenum cable do not have numbers; use color codes instead.

Meets cULus requirements without the need of an electrical ground connection.

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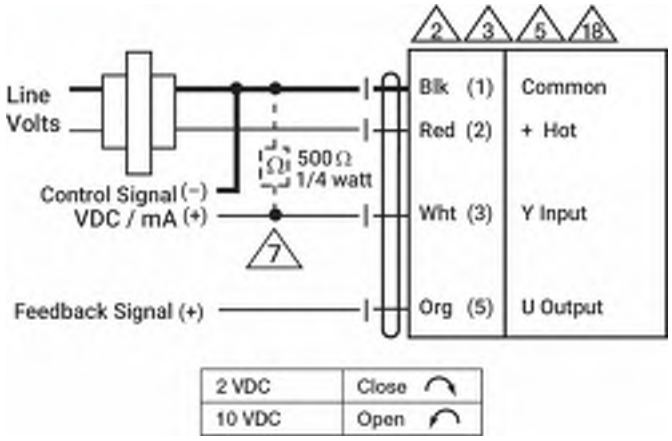
Wiring diagrams

AC 24 V Transformer



BELIMO

Modulating, Electrical Fail-Safe, 24 V, for DC 2...10 V or 4...20 mA Control Signal

- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V

Technical data sheet CQKB24-SR-LL

5-year warranty

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	2.5 W
	Power consumption in rest position	0.5 W
	Transformer sizing	5 VA
	Electrical Connection	22 GA plenum cable, 3 ft [1 m], with 1/2" conduit connector
	Overload Protection	electronic thoughout 0...90° rotation
	Electrical Protection	actuators are double insulated
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Position feedback U	2...10 V
	Bridging time (PF)	2 s
	Pre-charging time	5...20 s
	Angle of rotation	90°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	75 s / 90°
	Running time fail-safe	<60 s
	Noise level, motor	35 dB(A)
	Noise level, fail-safe	35 dB(A)
	Position indication	pointer
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02 CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	35...104°F [2...40°C]
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
Weight	Weight	0.55 lb [0.20 kg]
Materials	Housing material	UL94-5VA

Product features

Application Electrical fail-safe proportional ZoneTight actuator.

Valve selection should be done in accordance with the flow parameters and system specifications. The actuator is mounted directly to the valve without the need for tools or additional linkage.

The actuator operates in response to a 2...10 V or 4...20mA control signal.

Electrical installation

INSTALLATION NOTES

A Actuators with appliance cables are numbered.

2 Actuators may be connected in parallel. Power consumption and input impedance must be observed.

3 Actuators may also be powered by DC 24 V.

5 Only connect common to negative (-) leg of control circuits.

7 A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.

18 Actuators with plenum cable do not have numbers; use color codes instead.

Meets cULus requirements without the need of an electrical ground connection.

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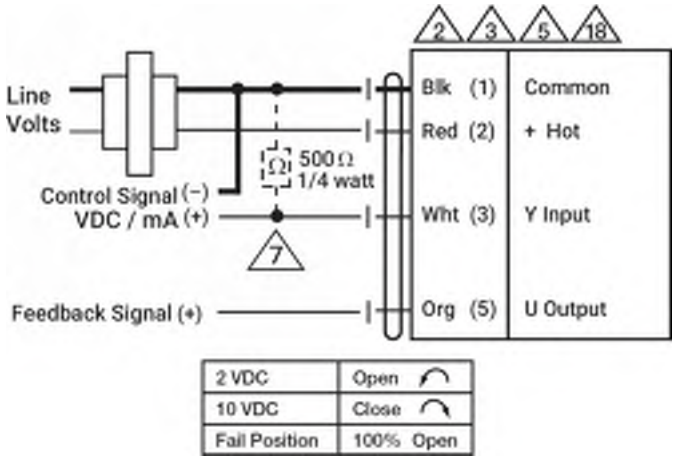
Wiring diagrams

AC 24 V Transformer



BELIMO

Stainless Steel Ball and Stem

Technical data sheet B309

5-year warranty

Type overview

Type	DN
B309	15

Technical data

Functional data	Valve size [mm]	0.5" [15]
	Fluid	chilled or hot water, up to 60% glycol
	Fluid Temp Range (water)	0...250°F [-18...120°C]
	Body Pressure Rating	600 psi
	Close-off pressure Δps	200 psi
	Flow	A-port: as stated in chart B-port: 70% of A – AB Cv
	Flow characteristic	A-port equal percentage, B-port modified for constant common port flow
	Servicing	maintenance-free
	Flow Pattern	3-way Mixing/Diverting
	Leakage rate	0% for A – AB, <2.0% for B – AB
	Controllable flow range	75°
	Cv	0.8
Materials	Valve body	Nickel-plated brass body
	Stem	stainless steel
	Stem seal	EPDM (lubricated)
	Seat	PTFE
	Characterized disc	TEFZEL®
	Pipe connection	NPT
	O-ring	EPDM (lubricated)
	Ball	stainless steel
Suitable actuators	Non-Spring	TR LRB(X) NRB(X) N4
	Spring	TFB(X) LF

Safety notes

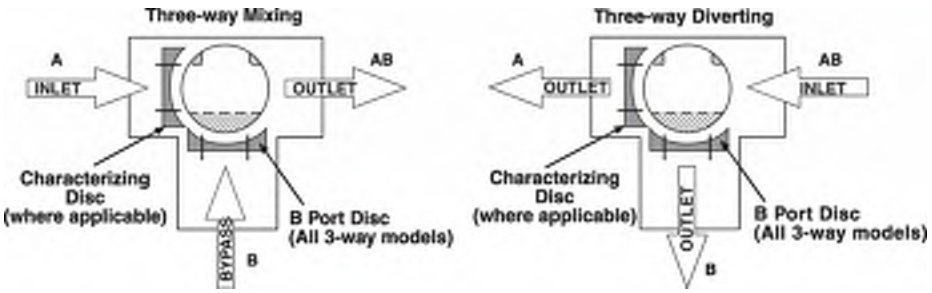
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.p65warnings.ca.gov

Product features

Application

This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or constant flow.

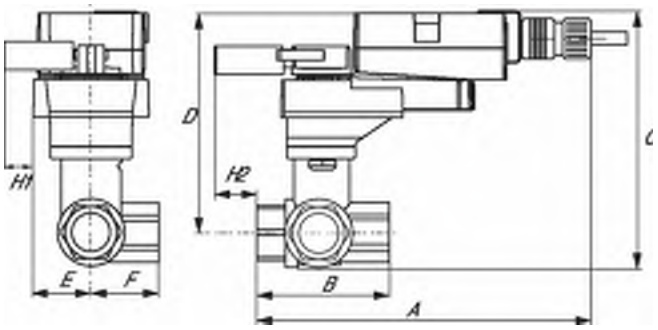
Flow/Mounting details



Dimensions

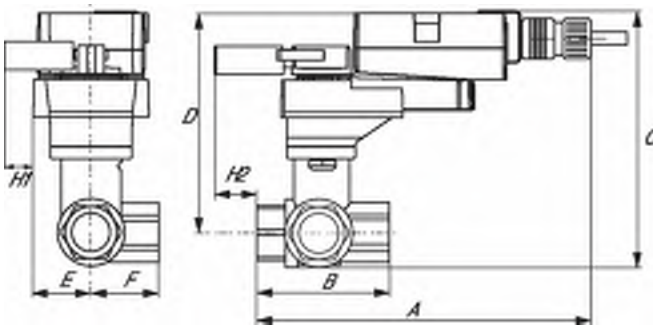
Type	DN	Weight
B309	15	0.66 lb [0.30 kg]

LRB, LRX



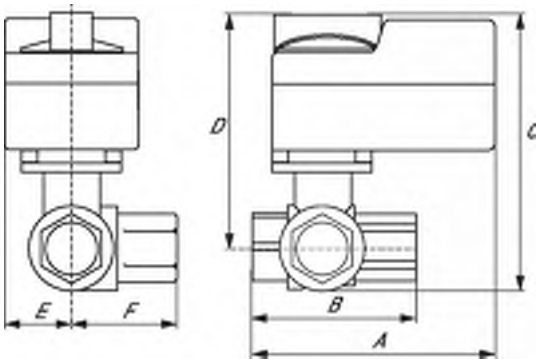
A	B	C	D	E	F	H1	H2
8.5" [216]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]

LRQB, LRQX



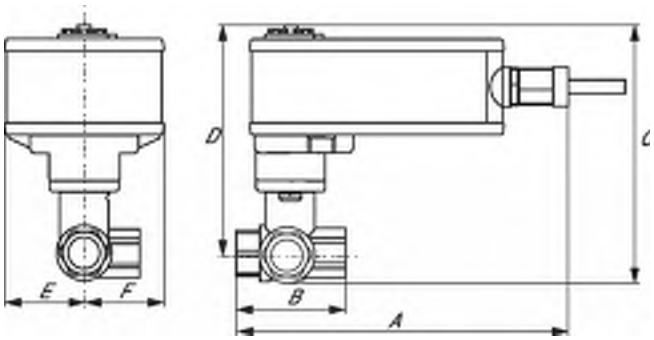
A	B	C	D	E	F	H1	H2
8.9" [226]	2.4" [60]	5.7" [146]	5.2" [131]	1.6" [40]	1.6" [40]	1.2" [30]	1.3" [33]

TR



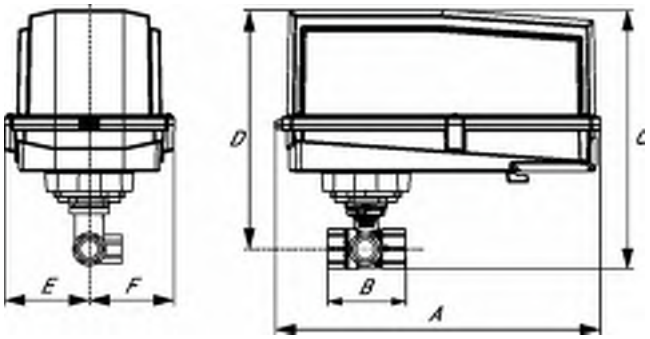
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.2" [31]

LF



A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

ARB N4, ARX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.2" [184]	6.7" [169]	3.1" [80]	3.1" [80]

BELIMO

Stainless Steel Ball and Stem

Technical data sheet B310

5-year warranty

Type overview

Type	DN
B310	15

Technical data

Functional data	Valve size [mm]	0.5" [15]
	Fluid	chilled or hot water, up to 60% glycol
	Fluid Temp Range (water)	0...250°F [-18...120°C]
	Body Pressure Rating	600 psi
	Close-off pressure Δps	200 psi
	Flow	A-port: as stated in chart B-port: 70% of A – AB Cv
	Flow characteristic	A-port equal percentage, B-port modified for constant common port flow
	Servicing	maintenance-free
	Flow Pattern	3-way Mixing/Diverting
	Leakage rate	0% for A – AB, <2.0% for B – AB
	Controllable flow range	75°
	Cv	1.2
Materials	Valve body	Nickel-plated brass body
	Stem	stainless steel
	Stem seal	EPDM (lubricated)
	Seat	PTFE
	Characterized disc	TEFZEL®
	Pipe connection	NPT
	O-ring	EPDM (lubricated)
	Ball	stainless steel
Suitable actuators	Non-Spring	TR LRB(X) NRB(X) N4
	Spring	TFB(X) LF

Safety notes

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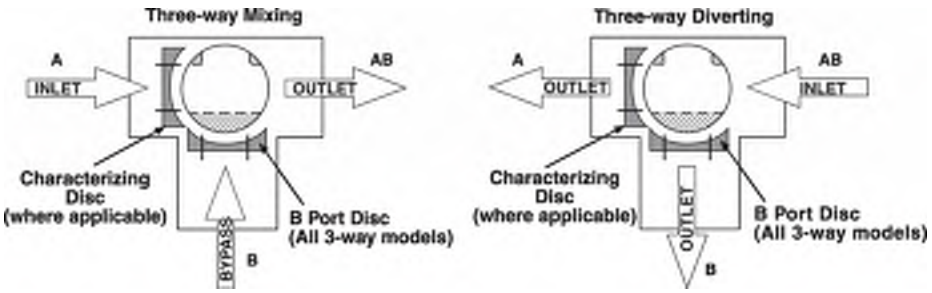
Product features

Application

This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or constant flow.

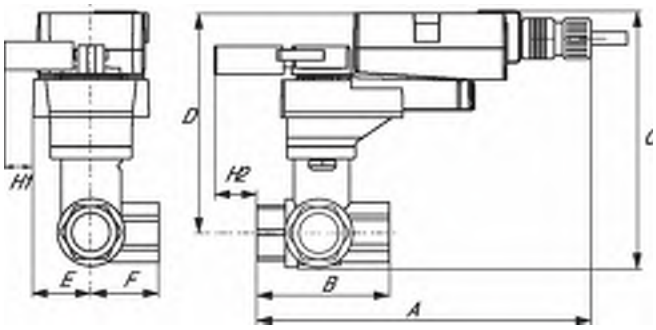
Flow/Mounting details



Dimensions

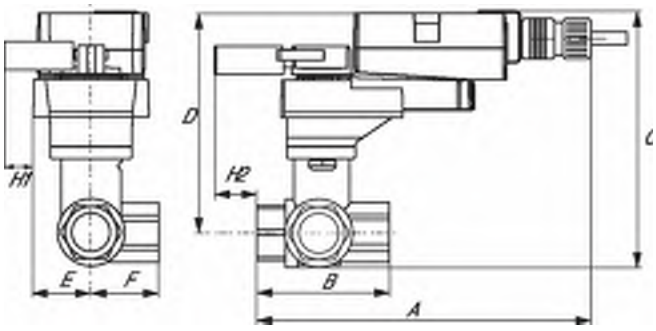
Type	DN	Weight
B310	15	0.66 lb [0.30 kg]

LRB, LRX



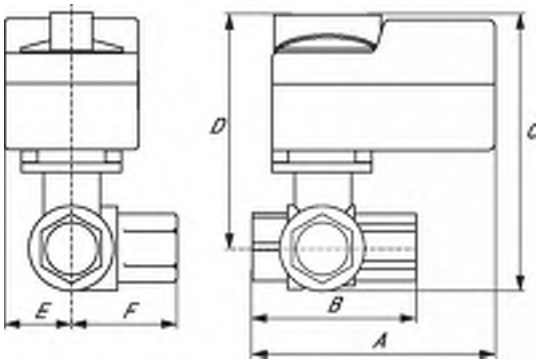
A	B	C	D	E	F	H1	H2
8.5" [216]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]

LRQB, LRQX



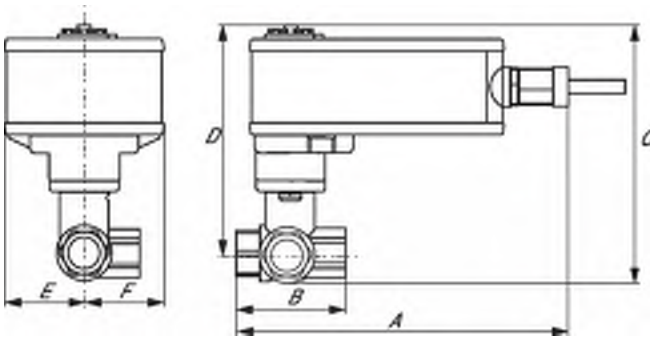
A	B	C	D	E	F	H1	H2
8.9" [226]	2.4" [60]	5.7" [146]	5.2" [131]	1.6" [40]	1.6" [40]	1.2" [30]	1.3" [33]

TR



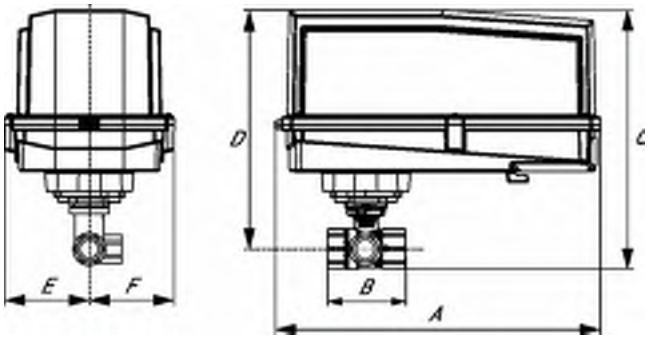
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.2" [31]

LF



A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

ARB N4, ARX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.2" [184]	6.7" [169]	3.1" [80]	3.1" [80]

BELIMO

Stainless Steel Ball and Stem

Technical data sheet B311

5-year warranty

Type overview

Type	DN
B311	15

Technical data

Functional data	Valve size [mm]	0.5" [15]
	Fluid	chilled or hot water, up to 60% glycol
	Fluid Temp Range (water)	0...250°F [-18...120°C]
	Body Pressure Rating	600 psi
	Close-off pressure Δps	200 psi
	Flow	A-port: as stated in chart B-port: 70% of A – AB Cv
	Flow characteristic	A-port equal percentage, B-port modified for constant common port flow
	Servicing	maintenance-free
	Flow Pattern	3-way Mixing/Diverting
	Leakage rate	0% for A – AB, <2.0% for B – AB
	Controllable flow range	75°
	Cv	1.9
Materials	Valve body	Nickel-plated brass body
	Stem	stainless steel
	Stem seal	EPDM (lubricated)
	Seat	PTFE
	Characterized disc	TEFZEL®
	Pipe connection	NPT
	O-ring	EPDM (lubricated)
	Ball	stainless steel
Suitable actuators	Non-Spring	TR LRB(X) NRB(X) N4
	Spring	TFB(X) LF

Safety notes

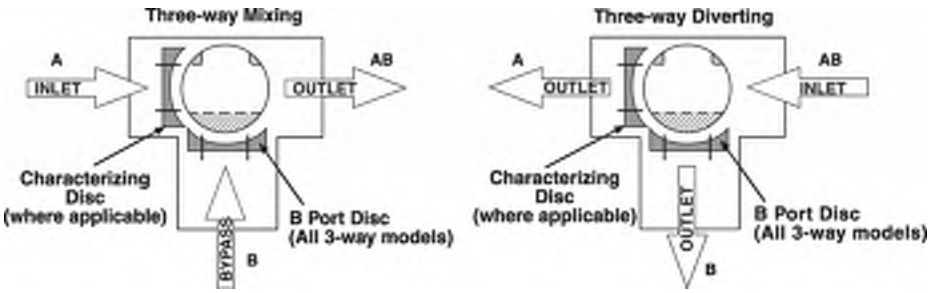
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.p65warnings.ca.gov

Product features

Application

This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or constant flow.

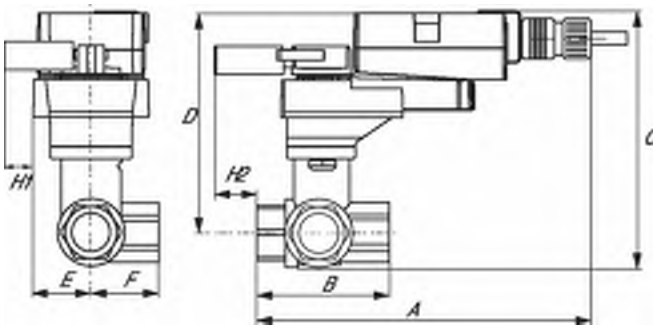
Flow/Mounting details



Dimensions

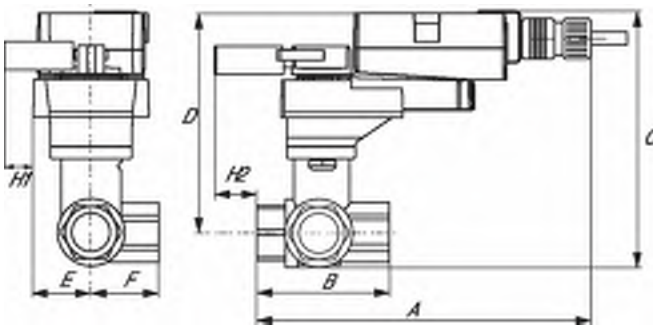
Type	DN	Weight
B311	15	0.66 lb [0.30 kg]

LRB, LRX



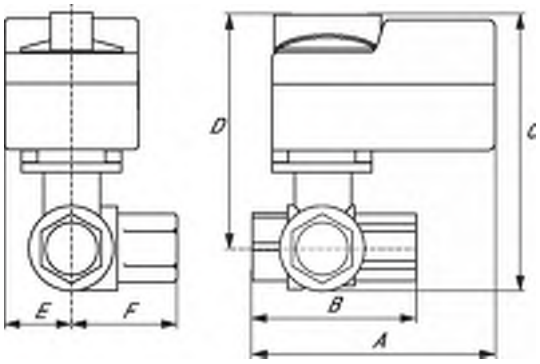
A	B	C	D	E	F	H1	H2
8.5" [216]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]

LRQB, LRQX



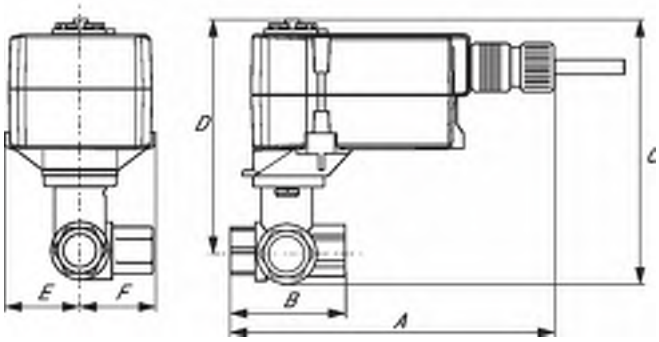
A	B	C	D	E	F	H1	H2
8.9" [226]	2.4" [60]	5.7" [146]	5.2" [131]	1.6" [40]	1.6" [40]	1.2" [30]	1.3" [33]

TR



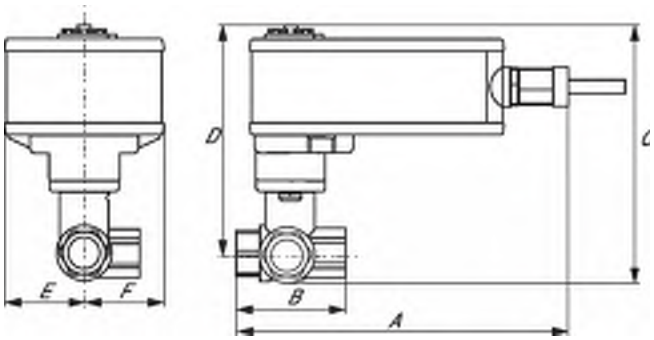
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.2" [31]

TFRB, TFRX



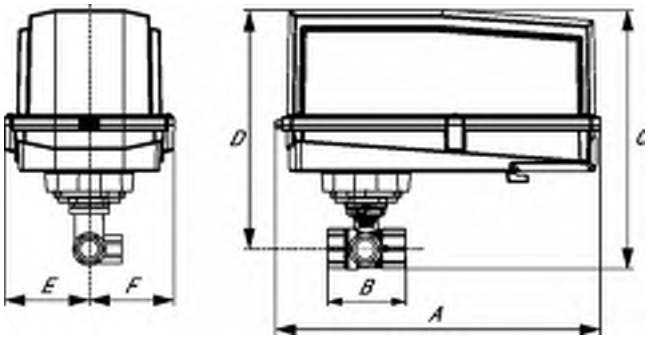
A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]

LF



A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

ARB N4, ARX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.2" [184]	6.7" [169]	3.1" [80]	3.1" [80]

BELIMO

Technical data sheet TR24-SR

Rotary actuator for ball valves
- **Torque motor 2 Nm**
- **Nominal voltage AC/DC 24 V**
- **Control modulating 2...10 V**

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	0.5 W
	Power consumption for wire sizing	1 VA
	Connection supply / control	Cable 1 m, 3 x 0.75 mm²
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	2 Nm
	Operating range Y	2...10 V
	Input Impedance	100 kΩ
	Manual override	with hand crank
	Running time motor	90 s / 90°
	Sound power level, motor	35 dB(A)
	Position indication	Mechanical
Safety	Protection class IEC/EN	III Safety Extra-Low Voltage (SELV)
	Degree of protection IEC/EN	IP40
	EMC	CE according to 2014/30/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	-7...50°C
	Storage temperature	-40...80°C
	Ambient humidity	Max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	1.1 kg

Safety notes

- This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Outdoor application: only possible in case that no (sea) water, snow, ice, insolation or aggressive gases interfere directly with the actuator and that is ensured that the ambient conditions remain at any time within the thresholds according to the data sheet.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.

Product features

Mode of operation
The actuator is connected with a standard modulating signal of 0...10 V and drives to the position defined by the positioning signal.

Simple direct mounting
Simple direct mounting on the ball valve with only one screw. The mounting orientation in relation to the ball valve can be selected in 90° steps.

Manual override
Manual override possible with lever (the gearing is disengaged as long as the self-resetting lever is pressed).

High functional reliability
The actuator is overload protected and automatically stops when the end stop is reached.
The actuator switches off for seven seconds in the case of blocking, then attempts to restart. If the blocked condition persists, the actuator attempts to restart once every two minutes a total of 15 times and subsequently only once every two hours.

Combination valve/actuator
Refer to the valve documentation for suitable valves, their permitted fluid temperatures and closing pressures.

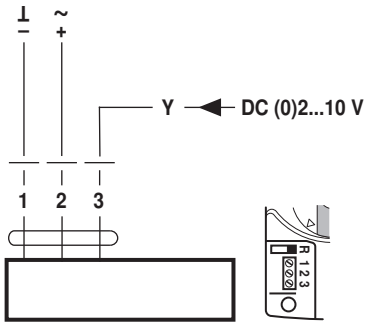
Electrical installation

Notes

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.

Wiring diagrams

AC/DC 24 V, modulating

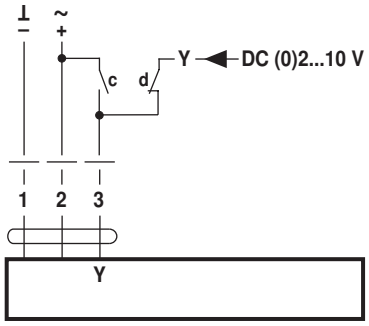


Cable colours:
1 = black
2 = red
3 = white

Direction of rotation R (standard)
when switch set to right position

Electrical installation

AC/DC 24 V, modulating, override control

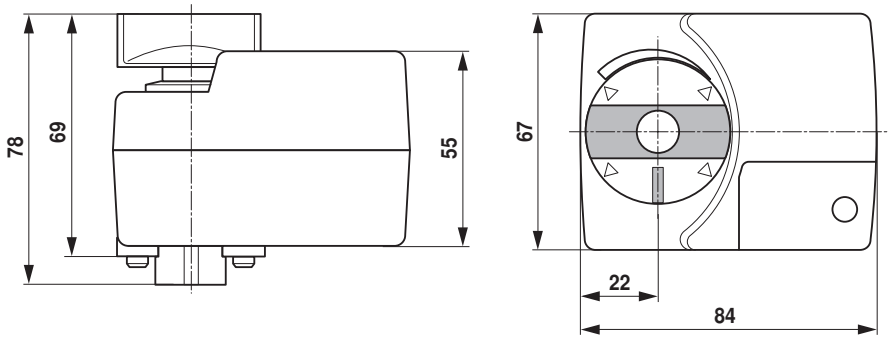


c	d	Y1 / Y2	
		Y1	A – AB = 100%
		Y2	A – AB = 0%
		DC (0)2...10 V	

Cable colours:
1 = black
2 = red
3 = white

Dimensions [mm]

Dimensional drawings



Further documentation

- The complete product range for water applications
- Data sheets for ball valves
- Installation instructions for actuators and/or ball valves
- General notes for project planning

TYPE DF JUNCTION BOXES

The 1100 DF are used as junction or pull boxes. These boxes are suitable for surface mounting with the standard screw cover or for flush mounting using either of the two optional covers (1100 HCF or 1100 FCD on page 212). Boxes and covers are made of high quality 16 GA or 14 GA steel. Four internal mounting holes, bonding screws and attachments are provided. All four sides have concentric knockouts, except when noted. These boxes are also available without knockouts (add suffix "N" to the catalog number). Enclosures are finished with ANSI/ASA 61 smooth gray heat fused powder paint, electrostatically applied on a pretreated

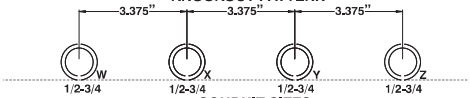
CSA Certified
UL Listed where noted *
NEMA/EEMAC 1 / IP30

Refer to p.734 to validate choice of substrate for the application

CATALOG NUMBER	DIMENSIONS					KNOCKOUTS		SHIP WGHT LBS.
	A	B	C	D	E	FACE A	FACE B	
*1100 DF060603	6	6	3	4	4	2-3-4	2-3-4	2
*1100 DF040404	4	4	4	2	2	W	W	1
*1100 DF060404	6	4	4	4	2	W-X	W	2
*1100 DF060604	6	6	4	4	4	2-3-4	2-3-4	3
*1100 DF080604	8	6	4	6	4	W-X	W-X	3
*1100 DF080804	8	8	4	6	6	6-7-8-9	6-7-8-9	4
*1100 DF100804	10	8	4	8	6	W-X	W-X	5
*1100 DF101004	10	10	4	8	8	6-7-8-9	3-4-5-6-7	6
*1100 DF120604	12	6	4	10	4	W-X-Y	W-X	5
*1100 DF120804	12	8	4	10	6	W-X-Y	W-X	6
*1100 DF121004	12	10	4	10	8	W-X-Y	W-X	7
*1100 DF121204	12	12	4	10	10	3-4-5-6-7	3-4-5-6-7	8
*1100 DF151204	15	12	4	13	10	W-X-Y-Z	W-X-Y	10
*1100 DF151504	15	15	4	13	13	W-X-Y-Z	W-X-Y-Z	13
*1100 DF161604	16	16	4	14	14	W-X-Y-Z	W-X-Y-Z	13
*1100 DF181204	18	12	4	16	10	W-X-Y	W-X-Y	11
*1100 DF181504	18	15	4	16	13	W-X-Y-Z	W-X-Y-Z	14
*1100 DF181804	18	18	4	16	16	W-X-Y-Z	W-X-Y-Z	16
*1100 DF242404	24	24	4	22	22	W-X-Y-Z	W-X-Y-Z	31
*1100 DF060606	6	6	6	4	4	2-3-4	2-3-4	3
*1100 DF080606	8	6	6	6	4	W-X	W-X	5
*1100 DF080806	8	8	6	6	6	6-7-8-9	6-7-8-9	5
*1100 DF100606	10	6	6	8	4	W-X	W-X	5
*1100 DF100806	10	8	6	8	6	W-X	W-X	6
*1100 DF101006	10	10	6	8	8	3-4-5-6-7	6-7-8-9	7
*1100 DF120606	12	6	6	10	4	W-X-Y	W-X	6
*1100 DF120806	12	8	6	10	6	W-X-Y	W-X	7
*1100 DF121006	12	10	6	10	8	W-X-Y	W-X	9
*1100 DF121206	12	12	6	10	10	3-4-5-6-7	3-4-5-6-7	10
*1100 DF151206	15	12	6	13	10	W-X-Y-Z	W-X-Y	11
*1100 DF151506	15	15	6	13	13	W-X-Y-Z	W-X-Y-Z	13
*1100 DF161606	16	16	6	14	14	2-3-4-5-6-7-8	2-3-4-5-6-7-8	14
*1100 DF181206	18	12	6	16	10	W-X-Y-Z	W-X-Y	13
*1100 DF181506	18	15	6	16	13	W-X-Y-Z	W-X-Y-Z	15
*1100 DF181806	18	18	6	16	16	W-X-Y-Z	W-X-Y-Z	17
*1100 DF241806	24	18	6	22	16	W-X-Y-Z	W-X-Y-Z	27
*1100 DF242406	24	24	6	22	22	W-X-Y-Z	W-X-Y-Z	34
*1100 DF101008	10	10	8	8	8	W-X	W-X	9
*1100 DF121208	12	12	8	10	10	W-X-Y	W-X-Y	12
*1100 DF151208	15	12	8	13	10	W-X-Y-Z	W-X-Y	13
*1100 DF161608	16	16	8	14	14	W-X-Y-Z	W-X-Y-Z	14
*1100 DF180808	18	8	8	16	6	W-X-Y-Z	W-X	17
*1100 DF181808	18	18	8	16	16	W-X-Y-Z	W-X-Y-Z	21
*1100 DF241208	24	12	8	22	10	W-X-Y-Z	W-X-Y	20
*1100 DF242408	24	24	8	22	22	W-X-Y-Z	W-X-Y-Z	38
*1100 DF202010	20	20	10	18	18	W-X-Y-Z	W-X-Y-Z	38

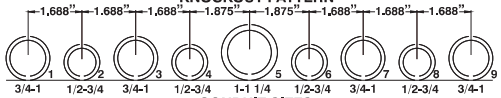
CUSTOMIZE IT BOX CAD

KNOCKOUT PATTERN

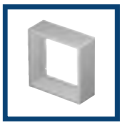


CONDUIT SIZES

KNOCKOUT PATTERN



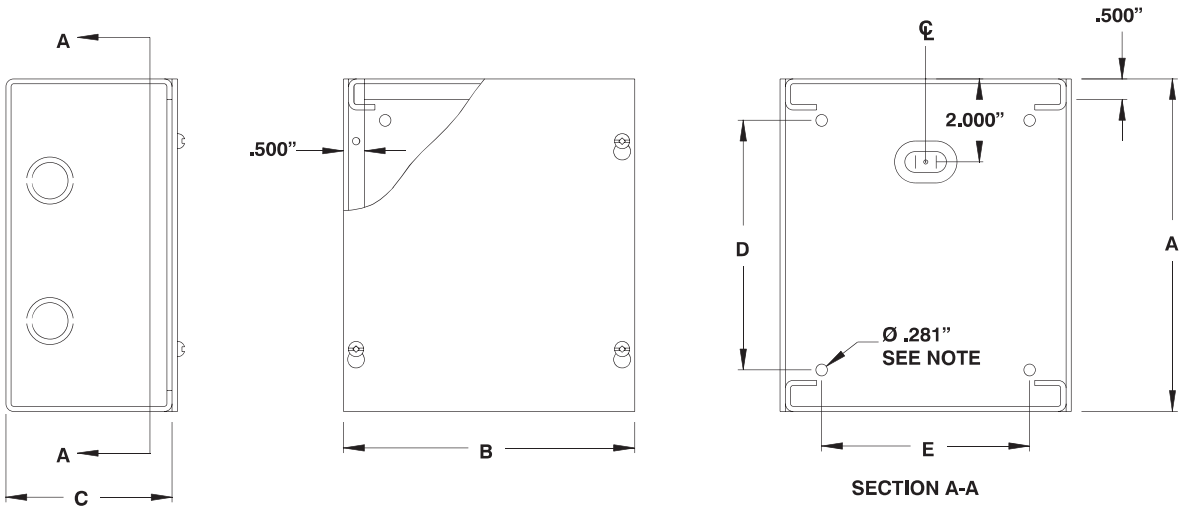
CONDUIT SIZES



p.190 p.534

NEMA 1 ENCLOSURES

TYPE DF JUNCTION BOXES



SECTION A-A

NOTE: -2 MTG. HOLE IF B=4.000"

CATALOG NUMBER	DIMENSIONS A	B	C	D	E	SHIP WGHT LBS.
*1100 DF040404N	4	4	4	2	-	1
*1100 DF060404N	6	4	4	4	-	2
*1100 DF060603N	6	6	3	4	4	2
*1100 DF060604N	6	6	4	4	4	3
*1100 DF080604N	8	6	4	6	4	3
*1100 DF080804N	8	8	4	6	6	4
*1100 DF100804N	10	8	4	8	6	5
*1100 DF101004N	10	10	4	8	8	6
*1100 DF120604N	12	6	4	10	4	5
*1100 DF120804N	12	8	4	10	6	6
*1100 DF121004N	12	10	4	10	8	7
*1100 DF121204N	12	12	4	10	10	8
*1100 DF151204N	15	12	4	13	10	10
*1100 DF151504N	15	15	4	13	13	12
*1100 DF161604N	16	16	4	14	14	13
*1100 DF181204N	18	12	4	16	10	11
*1100 DF181504N	18	15	4	16	13	14
*1100 DF181804N	18	18	4	16	16	16
*1100 DF060606N	6	6	6	4	4	3
*1100 DF080606N	8	6	6	6	4	5
*1100 DF080806N	8	8	6	6	6	5
*1100 DF100606N	10	6	6	8	4	5
*1100 DF100806N	10	8	6	8	6	6
*1100 DF101006N	10	10	6	8	8	7
*1100 DF120606N	12	6	6	10	4	6
*1100 DF120806N	12	8	6	10	6	7
*1100 DF121006N	12	10	6	10	8	9
*1100 DF121206N	12	12	6	10	10	10
*1100 DF151206N	15	12	6	13	10	11
*1100 DF151506N	15	15	6	13	13	13
*1100 DF161606N	16	16	6	14	14	14
*1100 DF181206N	18	12	6	16	10	13
*1100 DF181506N	18	15	6	16	13	15
*1100 DF181806N	18	18	6	16	16	17
*1100 DF241806N	24	18	6	22	16	27
*1100 DF242406N	24	24	6	22	22	34
*1100 DF302406N	30	24	6	28	22	42
*1100 DF362406N	36	24	6	34	22	48
1100 DF363606N	36	36	6	34	34	60

CATALOG NUMBER	DIMENSIONS A	B	C	D	E	SHIP WGHT LBS.
*1100 DF101008N	10	10	8	8	8	10
*1100 DF121208N	12	12	8	10	10	12
*1100 DF151208N	15	12	8	13	10	13
*1100 DF151508N	15	15	8	13	13	14
*1100 DF161608N	16	16	8	14	14	15
*1100 DF181808N	18	18	8	16	16	20
1100 DF241208N	24	12	8	22	10	20
1100 DF241808N	24	18	8	22	16	28
*1100 DF242408N	24	24	8	22	22	38
1100 DF303008N	30	30	8	28	28	48
*1100 DF362408N	36	24	8	34	22	55
1100 DF363008N	36	30	8	34	28	56
1100 DF363608N	36	36	8	34	34	65
*1100 DF121210N	12	12	10	10	10	18
*1100 DF151510N	15	15	10	13	13	22
*1100 DF181810N	18	18	10	16	16	28
*1100 DF202010N	20	20	10	18	18	32
*1100 DF241810N	24	18	10	22	16	36
*1100 DF242410N	24	24	10	22	22	41
*1100 DF302010N	30	20	10	28	18	44
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1100 DF303010N	30	30	10	28	28	60
*1100 DF362410N	36	24	10	34	22	59
1100 DF363010N	36	30	10	34	28	61
1100 DF363610N	36	36	10	34	34	70
*1100 DF121212N	12	12	12	10	10	20
1100 DF151512N	15	15	12	13	13	24
*1100 DF181212N	18	12	12	16	10	23
*1100 DF181812N	18	18	12	16	16	26
*1100 DF242412N	24	24	12	22	22	49
*1100 DF301812N	30	18	12	28	16	45
*1100 DF302412N	30	24	12	28	22	51
1100 DF303012N	30	30	12	28	28	54
*1100 DF362412N	36	24	12	34	22	57
1100 DF363012N	36	30	12	34	28	65
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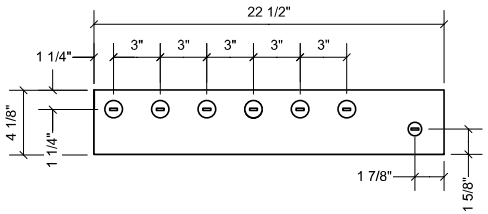
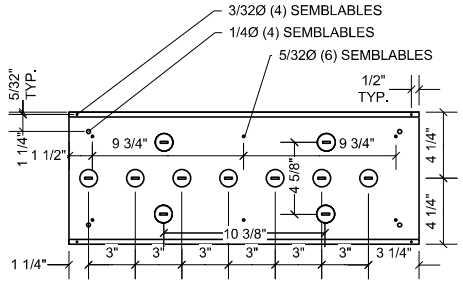
1100 DF484812N	48	48	12	46	46	118
1100 DF363618N	36	36	18	34	34	112

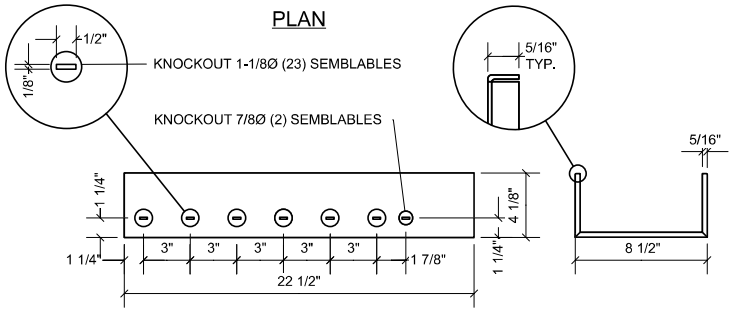
BASE



ÉLÉVATION - ARRIÈRE



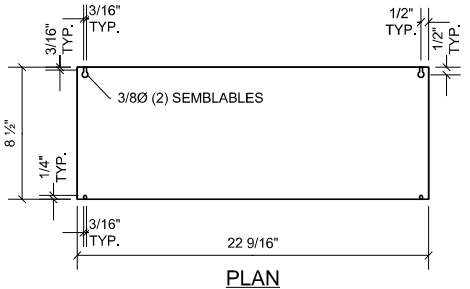
PLAN



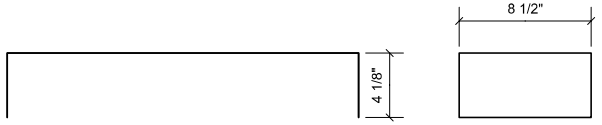
ÉLÉVATION - AVANT PROFIL

MATÉRIAUX: ACIER GALVANISÉ, ÉPAISSEUR MIN. 0,0336, CALIBRE 22 Ga

COUVERCLE



PLAN



ÉLÉVATION PROFIL

MATÉRIAUX: ACIER GALVANISÉ, ÉPAISSEUR MIN. 0,0336, CALIBRE 22 Ga
BOÎTIER APPROUVÉ CSA OU Ulc. AVEC ÉTIQUETTE D'APPROBATION À L'INTÉRIEUR DU COUVERCLE

REV	DESCRIPTION	DATE	CONC.	DESSIN	VÉRIF.
-	-	-	-	-	-
D	PERÇAGE	10-21	-	KBD	YA
C	VISIO	10-21	-	KBD	YA
B	PERÇAGE	09-21	-	FB	FB
A	FABRICATION	04-16	-	-	-

PROJET
2394Q

ÉCHELLE : 1/8"

TITRE DU PLAN
PLANS DE FABRICATION

Régulvar
3985, boulevard Industriel
Laval, Québec, H7L 4S3
450-629-0435

No:

Page: **F001**