Weaver
CONSTRUCTION MANAGEMENT
3679 S Huron Street, Suite 404 Englewood, Colorado 80110
Phone: (303) 789-4111 FAX: (303) 789-4310

SUBMITTAL TRANSMITAL

July 30, 2012

WCM Submittal No: 11373-003

PROJECT: **Harold Thompson Regional WRF**
Birdsall Rd.
Fountain, CO 80817
Job No. 2908

ENGINEER: **GMS, Inc.**
611 No. Weber St., #300
Colorado Springs, CO 80903
719-475-2935 Roger Sams

OWNER: **Lower Fountain Metropolitan Sewage Disposal District**
901 S. Santa Fe Ave.
Fountain, CO 80817
719-382-5303 James Heckman

CONTRACTOR: **HSI, Inc.**
7901 Hansen Rd.
Houston, TX 77061
713-947-1623 Colleen Orth

SUBJECT: Control Panels for the Multistage Blowers

SPEC SECTION: 11373 Blowers

PREVIOUS SUBMISSION DATES: NA

DEVIATIONS FROM SPEC: ___ YES _X_ NO

CONTRACTOR'S STAMP: This submittal has been reviewed by Weaver Construction Management and, unless indicated otherwise, has been found to be in conformance with the intent of the contract documents.

Contractor's Stamp:	Engineer's Stamp:
Date: 7/31/12 Reviewed by: John Jacob ( ) Reviewed Without Comments ( ) Reviewed With Comments	

ENGINEER'S COMMENTS:_____

_____

Control Panel & Instrumentation Submittal

HSI3100-0-ABCD-0-0-0

P.O. # 152258

Submittal # 12-6133-01A

Houston Service Industries

Houston Service Industries

HSI3100-0-ABCD-0-0-0

SCHEDULE OF EQUIPMENT

ITEM #	DESCRIPTION	MANUFACTURER	PART NUMBER	QUANTITY	UNIT
Quantities are per Panel Four(4) Panels will be Provided					
	Control Panel				
1	Enclosure, Type 4, Wall mount, with quarter turn latches	Saginaw	SCE-30EL2408LP	1	each
2	Back Panel	Saginaw	SCE-30P24	1	each
3	Circuit Breaker, UL489, 1-Pole, 5 Amp	Siemens	5SJ4111-7HG40	1	each
4	Power Supply, 24V, 2.5A, Current Limmiting, Short Circuit & Overload protection built in	Delta Electronics	DRP024V060W1AZ	1	each
5	Surge Suppressor, 120VAC, 2.5Amp,	Control Concepts	IC+102	1	each
6	MicroLogix 1200 PLC Processor, 120VAC, 14 AC Inputs, 10 Relay Outputs, 2 Communication Ports	Allen-Bradley	1762-L24AWAR	1	each
7	Analog Input Module, 4 Point	Allen-Bradley	1762-IF4	3	each
8	Analog Combination Module, 2 Input, 2 Output	Allen-Bradley	1762-IF20F2	1	each
9	Memory Module	Allen-Bradley	1762-MM1	1	each
10	6" Color Touchscreen, Enhanced CE version, NEMA 4X, non-expandable RAM	EZ Automation	EZC-T6C-R	1	each
11	Communication Cable from Touchscreen to AB Micrologix PLC	EZ Automation	EZ-MLOGIX-CBL	1	each
12	Pilot Light, 30mm, Nema 4X, LED, Full Voltage, Red	C3 Controls	FVLU120LR-PLLRD	1	each
13	Relay, DPDT, 10A	Finder	55.32.8.120.0030	2	each
14	Relay Base, 4-pole	Finder	94.04	2	each
	Typical Equipment on Each Panel				
15	Terminal Block, Feed Through, Finger Safe, 26-10awg, 41 Amp, 800Volt, Type UT4	Phoenix Contact	3044102	A/R	each
16	Ground Terminal Block, Finger Safe, 26-10awg, 41 Amp, 800Volt, Type UT4-PE	Phoenix Contact	3044128	A/R	each
17	Ground Bus Bar	Square D	PK Series	A/R	each
18	Wire Way	Thomas & Betts	TY series	A/R	ft

Item # 1

SAGINAW CONTROL & ENGINEERING

Your Enclosure Source®

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Part Information - SCE-30EL2408LP

Part Details - SCE-30EL2408LP

Printable Version

Part Number: SCE-30EL2408LP
Description: EL Enclosure
Height: 30.00 inches
Width: 24.00 inches
Depth: 8.00 inches
Page Number: 159
List Price: $329.69
Panel: SCE-30P24 -
Product Code: E3
Est. Shipweight: 85.00 lbs.
NEMA Rating: 12, 4

Construction -

- 0.075 In. carbon steel.
- Seams continuously welded and ground smooth.
- Flange trough collar around all sides of door opening.
- Oil-resistant gasket.
- Collar studs provided for mounting optional panels.
- Concealed hinge.
- Removable and interchangeable doors.
- Black quarter turn latches on three sides of the doors.
- Latches are opened or closed with a screwdriver.
- Mounting holes in back of enclosure.
- Mounting hardware, sealing washer and hole plug included.
- Removable print pocket.
- Ground studs on door and body.

Similar Part Numbers -

- SCE-20EL1206LP
- SCE-20EL1606LP
- SCE-20EL1608LP
- SCE-20EL1612LP
- SCE-20EL2006LP
- SCE-20EL2008LP
- SCE-20EL2012LP
- SCE-20EL2408LP
- SCE-24EL1206LP
- SCE-24EL1606LP
- SCE-24EL1608LP
- SCE-24EL2006LP
- SCE-24EL2008LP
- SCE-24EL2010LP
- SCE-24EL2012LP
- SCE-24EL2016LP
- SCE-24EL2406LP

CAD Package (STP, PDF, DWG)

Having trouble downloading drawings? Click Here for help.

Application -

Designed to house electrical and electronic controls, instruments and components. Provides protection from dust, oil and water. For outdoor application a drip shield is recommended.

Finish -

ANSI-61 gray powder coat inside and out. Optional Subpanels are powder coated white.

Options -

- Optional Tamper-resistant inserts are available.
- Optional mounting feet available.
- Door hardware available.

Industry Standards -

NEMA Type 4, 12, & 13
UL Listed Type 4 & 12
CSA Type 4 & 12
IEC 60529 IP 66

Notes -

Interchangeable latches and handles found on pages 147-148. Optional Enviroline 3-point latching system reviewed on page 161.

Item # 2

SAGINAW CONTROL & ENGINEERING

Your Enclosure Source®

Part Information - SCE-30P24

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Part Details - SCE-30P24

Printable Version

Part Number: SCE-30P24
Description: Subpanel, Bent
Height: 27.00 inches
Width: 21.00 inches
Depth: 0.88 inches
Page Number: 177
List Price: $59.43
Product Code: P3
Est. Shipweight: 16.00 lbs.
NEMA Rating: N/A
Edge Flanges: Four
Configuration: C

Similar Partnumbers -

- SCE-20P12
- SCE-20P16
- SCE-20P20
- SCE-20P20AL
- SCE-24P16
- SCE-24P20
- SCE-24P24
- SCE-30P16
- SCE-30P20
- SCE-30P30
- SCE-36P16
- SCE-36P24
- SCE-36P30
- SCE-36P36
- SCE-40P24
- SCE-42P24
- SCE-42P30
- SCE-42P36

Installation Information -

- Sub-Plate Layout & Grounding

Detailed Drawing
Downloadable Drawing (ZIP)

Having trouble downloading drawings? Click Here for help.

Finish -
Powder coated white epoxy polyester.

Options -
Sub-plates can be special ordered in Stainless Steel or Galvanized material. Please consult a factory representative for assistance.

New 5SJ Branch Circuit Protector

5SJ41 70 mm mounting depth

Features

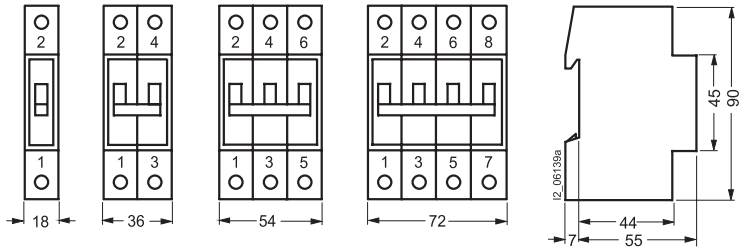
All new 5SJ41 miniature circuit breakers are designed to comply with **UL489 and CSA 22.2 No. 5-02** standards. They are used in single pole, branch circuit protection applications up to 240 VAC maximum and 60 VDC maximum. Refer to Technical Data (page 16/5) for additional information.

Selection and ordering data

I_n	Characteristic B Order No.	List Price $	Characteristic C Order No.	List Price $	Characteristic D Order No.	List Price $
A		1 item		1 item		1 item
1-pole						
0.3	—		**5SJ4114-7HG40**	**58.00**	**5SJ4114-8HG40**	**58.00**
0.5	—		**5SJ4105-7HG40**	**58.00**	**5SJ4105-8HG40**	**58.00**
1	—		**5SJ4101-7HG40**	**58.00**	**5SJ4101-8HG40**	**58.00**
1.6	—		**5SJ4115-7HG40**	**58.00**	**5SJ4115-8HG40**	**58.00**
2	—		**5SJ4102-7HG40**	**58.00**	**5SJ4102-8HG40**	**58.00**
3	—		**5SJ4103-7HG40**	**58.00**	**5SJ4103-8HG40**	**58.00**
4	—		**5SJ4104-7HG40**	**58.00**	**5SJ4104-8HG40**	**58.00**
5	—		**5SJ4111-7HG40**	**58.00**	**5SJ4111-8HG40**	**58.00**
6	**5SJ4106-6HG40**	**58.00**	**5SJ4106-7HG40**	**58.00**	**5SJ4106-8HG40**	**58.00**
8	—		**5SJ4108-7HG40**	**58.00**	**5SJ4108-8HG40**	**58.00**
10	**5SJ4110-6HG40**	**58.00**	**5SJ4110-7HG40**	**58.00**	**5SJ4110-8HG40**	**58.00**
13	**5SJ4113-6HG40**	**58.00**	**5SJ4113-7HG40**	**58.00**	**5SJ4113-8HG40**	**58.00**
15	**5SJ4118-6HG40**	**58.00**	**5SJ4118-7HG40**	**58.00**	**5SJ4118-8HG40**	**58.00**
16	**5SJ4116-6HG40**	**58.00**	**5SJ4116-7HG40**	**58.00**	**5SJ4116-8HG40**	**58.00**
20	**5SJ4120-6HG40**	**58.00**	**5SJ4120-7HG40**	**58.00**	**5SJ4120-8HG40**	**58.00**
25	**5SJ4125-6HG40**	**58.00**	**5SJ4125-7HG40**	**58.00**	**5SJ4125-8HG40**	**58.00**
30	**5SJ4130-6HG40**	**58.00**	**5SJ4130-7HG40**	**58.00**	**5SJ4130-8HG40**	**58.00**
32	**5SJ4132-6HG40**	**58.00**	**5SJ4132-7HG40**	**58.00**	**5SJ4132-8HG40**	**58.00**
35	**5SJ4135-6HG40**	**62.00**	**5SJ4135-7HG40**	**62.00**	**5SJ4135-8HG40**	**62.00**
40	**5SJ4140-6HG40**	**62.00**	**5SJ4140-7HG40**	**62.00**	**5SJ4140-8HG40**	**62.00**
45	**5SJ4145-6HG40**	**64.00**	**5SJ4145-7HG40**	**64.00**	**5SJ4145-8HG40**	**64.00**
50	**5SJ4150-6HG40**	**66.00**	**5SJ4150-7HG40**	**66.00**	**5SJ4150-8HG40**	**66.00**
60	**5SJ4160-6HG40**	**70.00**	**5SJ4160-7HG40**	**70.00**	**5SJ4160-8HG40**	**70.00**
63	**5SJ4163-6HG40**	**70.00**	**5SJ4163-7HG40**	**70.00**	**5SJ4163-8HG40**	**70.00**

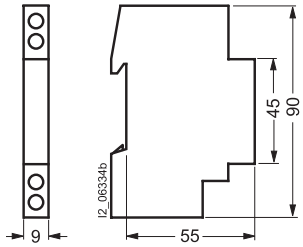
5SX2 supplementary protectors

5SX2,

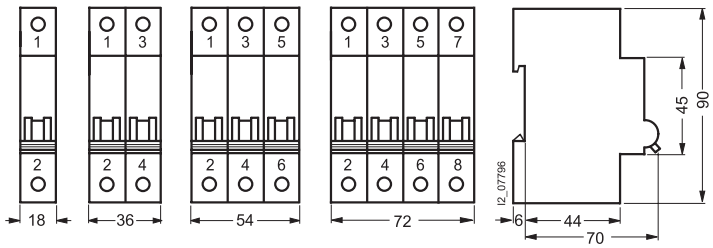


5SX9 auxiliary switch, 5SX9 fault signal

Additional component for 5SX2; can be retrofitted 5SX9 1.., 5SX9 2..

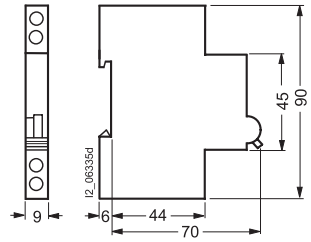


5SY4, 5SY5 supplementary protectors
5SJ4, single pole branch circuit protector

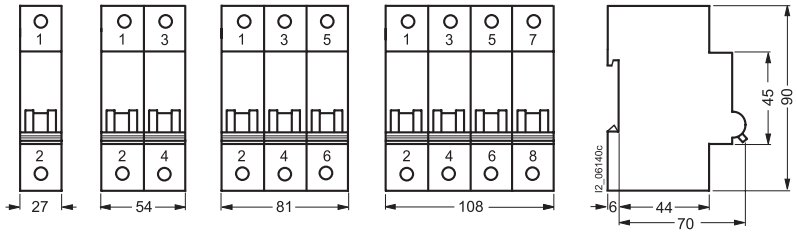


5ST3 auxiliary switch
5ST3 fault signal contact

can be retrofitted to 5SY4, 5SY5, 5SP4

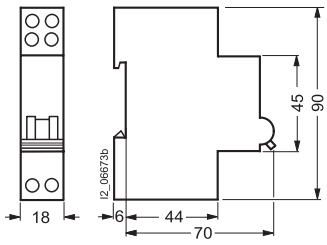


5SP4 supplementary protectors



5ST3 shunt trip
5ST3 undervoltage release

can be retrofitted
to 5SY4, 5SY5, 5SP4



Technical Data

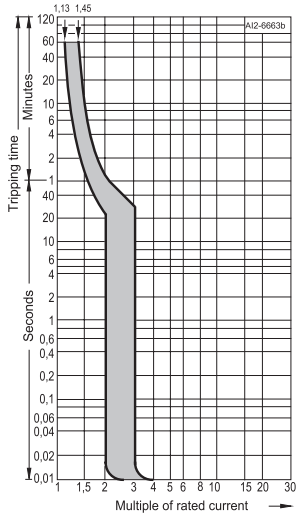
Specification	5SJ41 Mini-Breaker		
Tripping characteristic	B	C	D
Number of poles	1		
Rated voltage (UL 489)	V AC: 240 max. V DC: 60 max.		
Operating voltage, min.	24 VAC/DC		
Rated current	6 to 63 A	0.3 to 63 A	0.3 to 63 A
Interrupting Rating (UL 489) AC: Max. RMS Symmetrical	V AC 240: 14 kA; V DC 60: 10 kA	V AC 240: 14 kA (0.3 - 40 A) V AC 240: 5 kA (45 - 63 A) V DC 60: 10 kA (0.3 - 63 A)	V AC 240: 14 kA (0.3 - 20 A) V AC 240: 5 kA (25 - 63 A) V DC 60: 10 kA (0.3 - 63 A)
Standards	UL 489, CSA 22.2 No. 5-02, IEC/EN 60 898		
Certifications	UL, cUL, File No. E 243414		
Degree of protection	IP 10 acc. to DIN EN 60 529; IP 40 when panel mounted		
Device depth	70 mm		
Mounting technique	Standard 35 mm DIN rail		
Terminals	Identical screw terminals on both line and load sides		
Terminal tightening torque	31 lbs. in. (3.5 Nm)		
Wire Size	14-4 AWG (1.5 - 25 mm²) 60/75˚C, Cu only		
Recommended Wire Strip Length	0.59 in. (15 mm)		
Mounting Position	As Required		
Ambient temperature	-13˚ to +113˚F (-25˚ to +45˚C) temporary: +131˚F (+55˚C); max. humidity: 95%		
Calibration temperature	25˚C (77˚F) acc. to UL 489 30˚C (86˚F) acc. to EN 60 898		
Storage temperature	-40˚ to +167˚F (-40˚ to +75˚C)		
Resistance to vibration	60 m/s² at 10 Hz up to 150 Hz acc. to IEC 60 068-2-6		
Dimensions	see catalog page 16/23		

Trip characteristics

Tripping characteristics acc. to EN 60 898

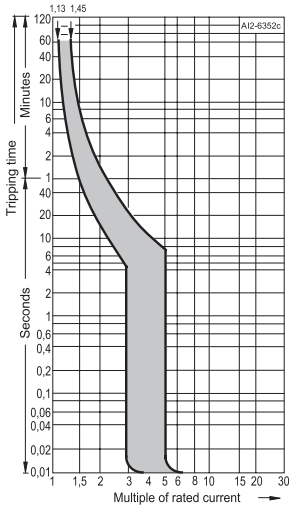
Tripping characteristic A, -5

Type A characteristic is designed to protect very sensitive circuits such as semiconductors. Magnetic trip point - 2 to 3 times I_n rating. Thermal trip point - 1.13 to 1.45 protector rating.



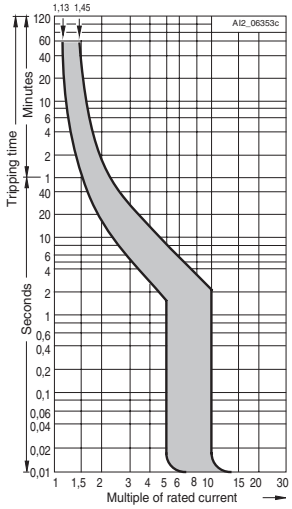
Tripping characteristic B, -6

Type B characteristic designed for European residential circuit protection. This characteristic can also be used for protection of computers and electronic equipment. Magnetic trip point - 3 to 5 times I_n rating. Thermal trip point - 1.13 to 1.45 protector rating.



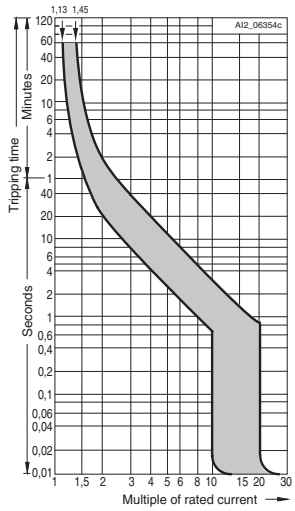
Tripping characteristic C, -7

Type C characteristic is for general device protection in control circuits. Magnetic trip point - 5 to10 times I_n rating. Thermal trip point - 1.13 to 1.45 protector rating.



Tripping characteristic D, -8

Type D characteristic is designed for high inrush loads. Magnetic trip point - 10 to 20 times I_n rating. Thermal trip point - 1.13 to 1.45 protector rating.



For different ambient temperatures, the current values of the delayed tripping operation change by approximately 5% per 10°K temperature difference. Specifically they increase for temperatures below 25°C (5SJ41), 30°C (5SP, 5SX, 5SY) and decrease for temperatures above 25°C (5SJ41), 30°C (5SP, 5SX, 5SY).

For DC voltages the maximum current values of the instantaneous tripping operation increase by a factor of 1.2.

If more that one electrical circuit is loaded in a series of miniature circuit breakers or supplementary protectors, the resulting increase in ambient temperature affects the characteristic curve. In this case an additional correction factor found in the following table must be used.

Number	1	2 - 3	4 - 6	> 7
Correction factor K	1.00	0.90	0.88	0.85

Item # 4

CliQ Din Rail Power Supply 24V 60W 1 Phase Plastic

DRP024V060W1AZ

DRP024V060W1AA

60Watts

Total Power: 60Watts
Input Voltage: 85-264Vac
# of Output: Single

Model number	DRP024V060W1AZ
Reference no.	**D0116888**
OUTPUT (DC)	
Output power	60W
Output voltage range	22 - 28V
Output current	2.5A
Residual ripple/peak switching (20MHz) (@ nominal values)	< 50mV / < 240mVpp
Mains buffering at nominal load (typ.)	> 20ms @ 115Vac, > 125ms @ 230Vac
Line regulation	< 0.5% typ. (@ 85 - 264Vac input, 100% load)
Load regulation	< 1% typ. (with rated input, 0 - 100% load)
INPUT (AC)	
Input voltage range	85 - 264Vac (DC input range 120 - 375Vdc)
Input frequency	47 - 63Hz
Nominal current	1.1A @ 115Vac, 0.7A @ 230Vac
Efficiency	> 85% typ.
Power factor	Conform to EN61000-3-2 STD
Inrush current limitation I^2t (+25°C) typ.	< 40A @ 115Vac, < 80A @ 230Vac
Leakage current	< 1mA

MECHANICAL DESIGN	
Case cover	Plastic (PC)
Dimensions (L x W x H)	120.6mm x 32mm x 113mm
Unit weight / box	0.325kg
MTBF	> 800,000 hrs
Noise	Sound pressure level (SPL) < 40dBA
Cooling	Convection
Input terminal	M4 x 3
Output terminal	M4 x 2
Mounting rail	Standard TS35 mounting rail
Shock proof	IEC60068-2-27
Vibration	IEC60068-2-6
Protection structure	EN60950 meet IPX0

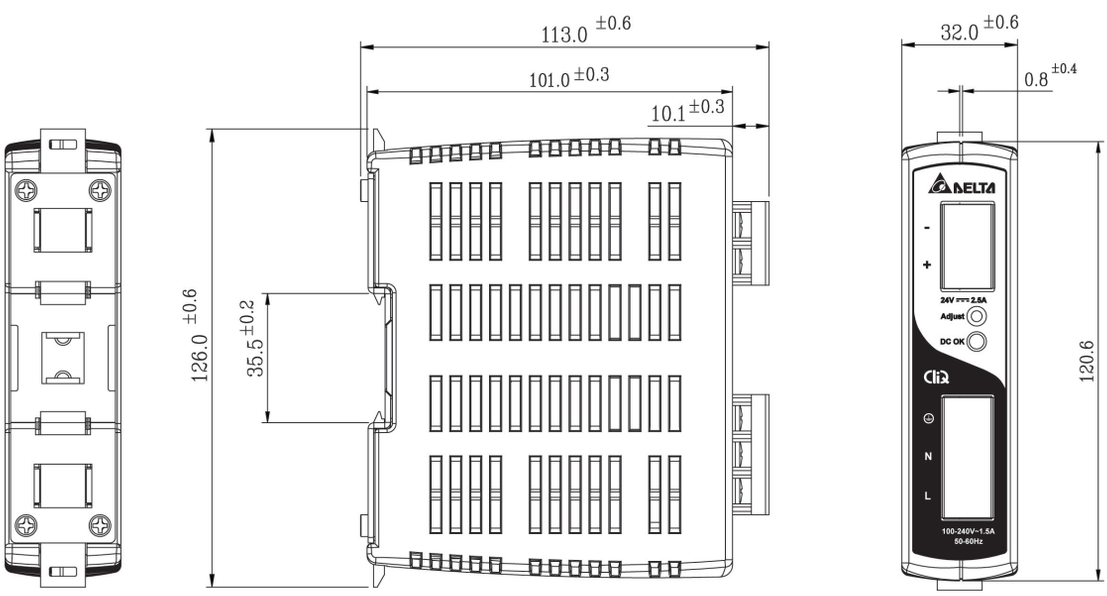
Special Features

- Ease of wire connection to terminals
- Compact design for easy handling
- Overload protection
- Overvoltage protection
- Thermal protection
- Power boost 150% for 3 seconds
- Expected life time : 10 years
- Shock proof IEC60068-2-27
- Vibration IEC60068-2-6
- Cooling : Convection
- Operating Humidity : < 95%
- Redundancy : Yes (with external ORing diode)
- RoHS compliant

3 PET
LISTED Ind. Cont. Eq.
LR 108238C
C L3M1 US
C US E191395

CliQ Din Rail Power Supply
24V 60W 1 Phase Plastic
DRP024V060W1AZ

MECHANICAL DRAWING



Delta Electronics (Thailand) Public Company Limited
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Tel: +662 709 2800
Fax: +662 709 2827
E-mail: VL@delta.co.th
www.deltaenergysystems.com

SAFETY / ENVIRONMENTAL

EMC / Emissions	Class B / EN55022, CISPR22, Class B; FCC Tilte 47; EN61204-3 (Class B on AC & Class A on DC side), EN55022:2006 Class B, EN61000-3-2:2006, EN61000-3-3:1995/ A1:2001/A2:2005
Immunity	EN55024:1998/A1:2001/A2:2003
Safety standard	UL508, CSA C22.2 No.107.1-01,UL60950-1, CSA C22.2 No.60950-1, IEC60950-1, EN60950-1, EN50178, IEC62103 and IEC60204-1
Voltage dips	Conform to EN61000-4-11
Galvanic isolation	Input to output: 4KVac Input to ground: 1.5KVac Output to ground: 1.5KVac
Operating ambient temperature	-20°C ~ 75°C *
Storage temperature	-25°C ~ 85°C
Operating humidity	< 95%
Note (*)	* Operating amb. < 0°C until -20°C derate power by 1% / °C; Operating amb. > 50°C derate power by 2.5% / °C; Operating amb. > 70°C derate power by 4% / °C

Item # 5

CONTROL CONCEPTS
A Subsidiary of the Liebert Corporation

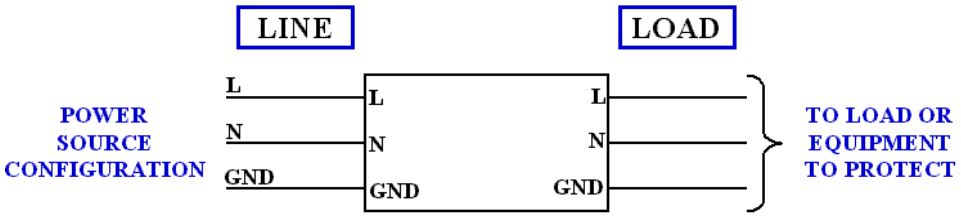
Technical Specification

IC+102

EMERSON

Islatrol® Plus
ACTIVE TRACKING® FILTER

CONNECTION DIAGRAM



The Islatrol Plus is a series connected high-frequency noise filter with transient protection. The Islatrol Plus units offer the flexibility of either receptacle/line cord connection or hard-wired connection to critical loads up to 30 Amperes. Applications include industrial or office equipment, computers placed in harsh environments, etc.

Nominal Operating Voltage	120 VAC, Single Phase
Operating Voltage Range	120 VAC +/- 25%
Operating Frequency Range	47 - 63 Hz
Rated Output (Amps)	2.5 Amperes
ANSI/IEEE C62.41 Category	Category A & B
Connection Type	Series Connected, Terminals #22 – #12
Phase Configuration	2 Wire + Gnd
Size	4 x 2.88 x 1.81 (Inches)
Enclosure	High Impact Plastic
Weight	1.0 lbs. (0.45 kgs.)
Modes Of Protection	L - N, L - G, N - G
Indication of Suppression Status	Green LED Power Indication
Response Time	< .5 ns Normal mode
Operating Temperature	-40°C TO 45°C
Operating Humidity	0% TO 95% Non-condensing
Certifications	UL 1283, CUL, ISO 9001
Warranty	10 Year
Maximum Continuous Operating Voltage (MCOV)	
Line to Neutral	150 VAC
Peak Surge Current Capability (8 x 20μs)	
Line to Neutral	15,000 Amps
Line to Ground	15,000 Amps
Neutral to Ground	15,000 Amps
Total	45,000 Amps
Load Surge Current Rating	
10 MSEC	5 x Nominal
1 SEC	3 x Nominal
10 SEC	2 x Nominal
ANSI/IEEE C62.41 Cat A Ringwave (6 kV, 200A, 100 kHz)	
Normal Mode	1.0 V
Common Mode	302 V
ANSI/IEEE C62.41 Cat B Ringwave (6 kV, 500A, 100 kHz)	
Normal Mode	178 V
Common Mode	302 V
Frequency Response	
Normal Mode	60 dB minimum, forward/reverse, 100 kHz to 50 MHz
Common Mode	60 dB minimum, forward/reverse, 5 MHz to 50 MHz

Item # 6

Rockwell Automation

MicroLogix 1200 Controllers

General Specifications

Cat. No.	1762-L24AWA 1762-L24AWAR	1762-L24BWA 1762-L24BWAR	1762-L24BXB 1762-L24BXBR	1762-L40AWA 1762-L40AWAR	1762-L40BWA 1762-L40BWAR	1762-L40BXB 1762-L40BXBR
Dimensions (HxWxD), Approx.	90 x 110 x 87mm (3.54 x 4.33 x 3.43 in) ¬			90 x 160 x 87mm (3.54 x 6.30 x 3.43 in) ¬		
Weight	0.9 kg (2.0 lb)			1.1 kg (2.4 lb)		
Input Voltage Range	85...265V ac @ 47...63 Hz		20.4...26.4V dc	85...265V ac @ 47...63 Hz		20.4...26.4V dc
Input Voltage, Nom.	100/120V ac, 200/240V ac		24V dc	100/120V ac, 200/240V ac		24V dc
Apparent Input Power, Max.	68 VA	70 VA	27 VA	80 VA	82 VA	40 VA
Real Input Power, Max.	29W	31W	27W	37W	38W	37W
Power Supply Maximum Inrush	25A for 8 ms @ 120V ac 40A for 4 ms @ 240V ac		15A for 20 ms @ 24V dc	25A for 8 ms @ 120V ac 40A for 4 ms @ 240V ac		15A for 20 ms @ 24V dc
Power Supply Output	400 mA @ 5V dc 350 mA @ 24V dc	400 mA @ 5V dcT 350 mA @ 24V dcT	400 mA @ 5V dc 350 mA @ 24V dc	600 mA @ 5V dc 500 mA @ 24V dc	600 mA @ 5V dc‡ 500 mA @ 24V dc‡	600 mA @ 5V dc 500 mA @ 24V dc
User Output Power	—	24V dc @ 250 mAT 400 µF max.	—	—	24V dc @ 400 mA‡ 400 µF max.	—
Operating Temperature	0...55 °C (32...131 °F) ambient					
Storage Temperature	-40...85 °C (-40...185 °F) ambient					
Operating Humidity	5...95% (without condensation)					
Vibration						
Operating	10...500 Hz, 5 g, 0.030 in max. peak-to-peak					
Relay Operation	1.5 g					
Shock						
Shock, Operating	30 g					
Shock, Relay Operation	7 g					
Shock, Non-Operating	50 g panel mounted, 40g DIN rail mounted					
Agency Certification	• UL 508 • C-UL under CSA C22.2 no. 142 • Class I, Div. 2, Groups A, B, D, B (UL 1604, C-UL under CSA C22.2 no. 213) • CE/C-Tick compliant for all applicable directives/acts.					
Electrical/EMC	The controller has passed testing at the following levels: • IEC1000-4-2: 4 kV contact, 8 kV air, 4 kV indirect • IEC1000-4-3: 10V/m • IEC1000-4-4: 2 kV, 5 kHz; communication cable: 1 kV, 5 kHz • IEC1000-4-5: communication cable 1 kV DM (differential mode) • I/O: 2 kV CM (common mode), 2 kV DM (differential mode) • Power Supply: 4 kV CM (common mode), 2 kV DM (differential mode) • IEC1000-4-6: 10V, communication cable 3V§					

¬ Height = 104 mm (4.09 in) with DIN latch open.
T Total load of the 5V, 24V, and user power output shall not exceed 12W.
‡ Total load of the 5V, 24V, and user power output shall not exceed 16W.
§ Conducted immunity frequency range may be 150 kHz to 30 MHz if the radiated immunity frequency range is 30 MHz to 1000 MHz.

MicroLogix 1200 Controllers

The MicroLogix 1200 controller is available with 24 or 40 built-in I/O. Controllers with 24V dc inputs that also have ac-input power supplies include a built-in power supply for user output power.

Cat. No.	Number of I/O	Input Type	Input Signal Delay	Output Type	Continuous Output Current, Max.	User Output Power
1762-L24BWA 1762-L24BWAR	14 inputs 10 outputs	24V dc sink or source	Selectable: 0.025, 0.075, 0.1, 0.25, 0.5, 1, 2, 4, 8, or 16 ms	Relay Contact	(See relay contact output specs.) • 8A/common • 30A total @ 150V ac • 20A total @ 240V ac	24V dc @ 250 mA
1762-L40BWA 1762-L40BWAR	24 inputs 16 outputs					24V dc @ 400 mA
1762-L24BXB 1762-L24BXBR	14 inputs 10 outputs			5 Relay 5 FET (24V dc)	(See FET and relay contact output specs.) • 7.5A/common • 30A total @ 150V ac • 20A total @ 240V ac	—
1762-L40BXB 1762-L40BXBR	24 inputs 16 outputs			8 Relay 8 FET (24V dc)	(See FET and relay contact output specs.)	
1762-L24AWA 1762-L24AWAR	14 inputs 10 outputs	120V ac	On: 2...20 ms Off: 10...20 ms	Relay Contact	• 8A/common • 30A total @ 150V ac • 20A total @ 240V ac	
1762-L40AWA 1762-L40AWAR	24 inputs 16 outputs					

Input Specifications

Cat. No.	1762-L24AWA, 1762-L40AWA 1762-L24AWAR, 1762-L40AWAR	1762-L24BWA, 1762-L24BXB, 1762-L40BWA, 1762-L40BXB 1762-L24BWAR, 1762-L24BXBR, 1762-L40BWAR, 1762-L40BXBR	
		Inputs 0 to 3	Inputs 4 and up
On-State Voltage Range	79...132V ac	14...26.4V dc @ 55 °C (131 °F) 14...30.0V dc @ 30 °C (86 °F)	10...26V dc @ 55 °C (131 °F) 10...30.0V dc @ 30 °C (86 °F)
Off-State Voltage Range	0...20V ac	0...5V dc	
Operating Frequency	47...63 Hz	0...20 kHz	0...1 kHz (depends on scan time)
On-State Current			
Minimum	5.0 mA @ 79V ac	2.5 mA @ 14V dc	2.0 mA @ 10V dc
Nominal	12 mA @ 120V ac	7.3 mA @ 24V dc	8.9 mA @ 24V dc
Maximum	16.0 mA @ 132V ac	12.0 mA @ 30V dc	12.0 mA @ 30V dc
Off-State Leakage Current, Max.	2.5 mA	1.5 mA	
Impedance, Nom.	12 kΩ @ 50 Hz 10 kΩ @ 60 Hz	3.3 kΩ	2.7 kΩ
Inrush Current	250 mA	—	—

Relay Contact Output Specifications

Maximum Voltage	Current			Apparent Power	
	Make	Break	Continuous	Make	Break
240V ac	7.5A	0.75A	2.5A	1800 VA	180 VA
120V ac	15A	1.5A	2.5A		
125V dc	0.22A		1.0A	28 VA	
24V dc	1.2A		2.0A		

FET Output Specifications

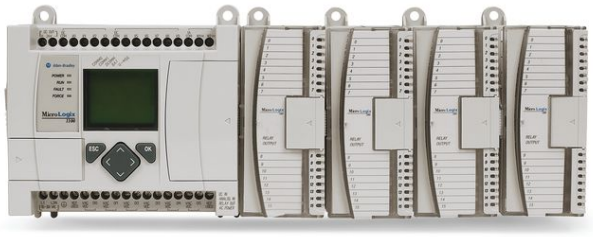
Cat. No.	1762-L24BXB, 1762-L24BXBR, 1762-L40BXB, 1762-L40BXBR	
	General Operation	High-Speed Operation¬ (Output 2 Only)
On-State Voltage Drop		
at maximum load current	1V dc	—
at maximum surge current	2.5V dc	
Current Rating per Output		
maximum load	1.5A @ 30 °C (86 °F), 1.0A @ 55 °C (131 °F)	100 mA
minimum load	1.0 mA	10 mA
maximum leakage	1.0 mA	1.0 mA
Turn-On Time, Max.	0.1 ms	6 ms
Turn-Off Time, Max.	1.0 ms	18 ms
Repeatability, Max.	—	2 ms
Drift, Max.	—	1s per 5 °C (9 °F)

¬ Output 2 has increased functionality over the other FET outputs. Output 2 can be used as the other FET outputs. But, in addition, within a limited current range, it may be operated at a higher speed. Output 2 also provides a pulse train output (PTO) or pulse width modulation output (PWM) function.

Item # 7, 8, 19

Rockwell Automation

1762 MICROLOGIX EXPANSION I/O



MicroLogix 1100 controller with four expansion I/O modules

Expansion I/O Modules

The 1762 MicroLogix expansion I/O modules are compatible with MicroLogix 1100, MicroLogix 1200, and MicroLogix 1400 controllers. If your application requires more I/O than the built-in I/O provided by the controller, add expansion I/O modules.

Install the expansion I/O modules to the right of the controller, either on a panel with two mounting screws or on a DIN rail. You can use digital and analog I/O modules in many combinations, up to the maximum supported by the controller. The current loading capacity of the controller's built-in power supply may limit the actual number of I/O modules that can be connected to the controller.

Features

- Integrated high-performance I/O bus
- Software keying to prevent incorrect positioning within the system
- Finger-safe terminal blocks for I/O wiring
- Label to record I/O terminal designations
- Network support includes EtherNet/IP, DeviceNet, and DH-485 (local only)
- Digital, analog, and specialty I/O modules available

Maximum 1762 Expansion I/O Modules per Controller

Controller	Number I/O Modules, Max.
MicroLogix 1100	4
MicroLogix 1200	6
MicroLogix 1400	7

Environmentals and Certifications

Environmental Specifications

	1762 MicroLogix Expansion I/O Modules
Operating Temperature	-20…65 °C (-4…149 °F) (on selected modules)
Operating Humidity	5…95% (without condensation)
Operating Altitude, Max.	2,000 m (6,561 ft)
Vibration, Operating	10…500 Hz, 5 g, 0.015 in peak-to-peak
Vibration, Relay Operation	2 g
Shock, Operating	30 g panel mounted, 20 g DIN-rail mounted
Shock, Relay Operation	7.5 g panel mounted, 5 g DIN rail mounted
Shock, Nonoperating	40 g panel mounted, 30 g DIN rail mounted
Dimensions (HxWxD), Approx.	90 x 40 x 87mm (3.543 x 1.575 x 3.425 in.)✶
Radiated and Conducted Emissions	EN50081-2 Class A
ESD Immunity (IEC 1000-4-2)	4 kV contact, 8 kV air, 4 kV indirect
Radiated Immunity (IEC 1000-4-3)	10V/m, 80-1000 MHz, 80% amplitude modulation, +900 MHz keyed carrier
Fast Transient Burst (IEC 1000-4-4)	2 kV, 5 kHz
Surge Immunity (IEC 1000-4-5)	2 kV common mode, 1 kV differential mode
Conducted Immunity (IEC 1000-4-6)	10V, 0.15…80 MHz❄

✶ Height including mounting tabs is 110 mm (4.33 in.).
❄ Conducted immunity frequency range may be 150 kHz…30 MHz if the radiated immunity frequency range is 30 MHz…1000 MHz.

Digital Output Module

Cat. No.	Outputs	Voltage Category	Operating Voltage Range	Continuous Current per Output, Max.	Continuous Current per Module, Max.	Off-State Leakage Current, Max.	Bus Current Load, Max.
1762-OA8	8 (4 points/group)	100...240V AC	85...265V AC @ 47...63 Hz)	0.25 A @ 55 °C (131 °F) 0.5 A @ 30 °C (86 °F)	2.0 A (1.0 A per common) @ 55 °C (131 °F) 4.0 A (2.0 A per common) @ 30 °C (86 °F)	2 mA @ 132V 2.5 mA @ 265V	115 mA @ 5V DC (0.575 W)
1762-OB8	8	24V DC source	20...26.4V DC	0.5 A @ 55 °C (131 °F) 1.0 A @ 30 °C (86 °F)	4.0 A @ 55 °C (131 °F) 8.0 A @ 30 °C (86 °F)	1.0 mA	115 mA @ 5V DC (0.575 W)
1762-OB16	16	24V DC source	20...26.4V DC	0.5 A @ 55 °C (131 °F) 1.0 A @ 30 °C (86 °F)	4.0 A @ 55 °C (131 °F) 8.0 A @ 30 °C (86 °F)	1.0 mA	175 mA @ 5V DC (0.88 W)
1762-OW8	8 (4 points/group)	AC/DC N.O. contact	5...265V AC 5...125V DC	2.5 A❄	16.0 A (8.0 A per common)	0 mA	80 mA @ 5V DC (0.40 W) 90 mA @ 24V DC (2.16 W)
1762-OW16	16 (4 points/group)	AC/DC N.O. contact	5...265V AC 5...125V DC	2.5 A❄	16.0 A (8.0 A per common)	0 mA	120 mA @ 5V DC (0.60 W) 140 mA @ 24V DC (3.36 W)
1762-OX6I	6 N.C., N.O.	AC/DC Type C Relay	5...265V AC 5...125V DC	7.0 A❄	30.0 A (7.0 A per common❄)	0 mA	110 mA @ 5V DC (0.55 W) 110 mA @ 24V DC (2.64 W)
1762-OV32T	32 (16 points/group)	24V DC sink	10.2...26.4V DC	0.5 A @ 60 °C (140 °F)	4.0 A (2.0 A per common) @ 60 °C (140 °F)	0.1mA @ 26.4V DC	175 mA @ 5V DC
1762-OB32T	32 (16 points/group)	24V DC source	10.2...26.4V DC	0.5 A @ 60 °C (140 °F)	4.0 A (2.0 A per common)@ 60 °C (140 °F)	0.1mA @ 26.4V DC	175 mA @ 5V DC

Digital Input Modules

Cat. No.	Inputs	Voltage Category	Operating Voltage Range	On-State Current, Max.	Impedance, Nom.	Signal Delay, Max.	Off-State Voltage and Current, Max.	Bus Current Draw, Max.
1762-IA8	8	100/120V AC	79...132V AC @ 47...63 Hz	16 mA @ 132V AC, 63 Hz	12 kΩ @ 50 Hz 10 kΩ @ 60 Hz	On/Off: 20 ms	20V AC 2.5 mA	50 mA @ 5V DC (0.25 W)
1762-IQ8	8	24V DC sink/source	10...26.4V DC @ 55 °C (131 °F) 10...30V DC	12 mA @ 30V DC	3 kΩ	On/Off: 8 ms	5V DC 1.5 mA	50 mA @ 5V DC (0.25 W)
1762-IQ16	16 (8 points/group)	24V DC sink/source	@ 30 °C (86 °F)	12 mA @ 30V DC	3 kΩ	On/Off: 8 ms	5V DC 1.5 mA	60 mA @ 5V DC (0.25W)
1762-IQ32T	32 (8 points/group)	24V DC sink/source	10...26.4V DC 10...30V DC❄	6.5 mA @ 30.0V DC	4.7 kΩ	On/Off: 8 ms	5V DC 1.0 mA	170 mA @ 5V DC

❄ See MicroLogix 1762-IQ32T DC Input Module Installation Instructions, publication 1762-IN019, for derating chart.

Digital Combination Modules

Cat. No.	Inputs/Outputs	Voltage Category	Operating Voltage Range	On-State Current, Max.	Continuous Current per Output, Max.	Off-State Voltage and Current, Max.	Off-State Leakage Current, Max.	Impedance, Nom.	Signal Delay, Max.	Bus Current, Max.
1762-IQ8OW6	8 inputs	24V DC sink/source	10...26.4 V DC @ 65 °C 10...30V DC @ 30 °C	10 mA @ 5V DC	—	5V DC 1.5 mA	—	3 kΩ	On/Off: 8 ms	110 mA @ 5V DC (0.25 W) 80 mA @ 24 Vdc
	6 outputs	AC/DC N.O. contact	5...265V AC 5...125V DC	—	2.5 A (8.0 A per module, max.)	—	0 mA	—	—	110 mA @ 5V DC (0.40 W) 80 mA @ 24 VDC (2.16 W)

Analog I/O Modules

Cat. No.	Inputs/Outputs	Analog Ranges	Bus Current Draw, Max.	Overall Accuracy✶	Resolution Across Full Range	Typical Update Period
1762-IF4	4 differential inputs (bipolar)	Voltage: ±10V Current: 4...20 mA	40 mA @ 5V DC 50 mA @ 24V DC	±0.3% full scale @ 0...55 °C (32...131 °F) ±0.24% full scale @ 25 °C (77 °F)	15 bits	130, 250, 290, 450, 530 ms (selectable)
1762-OF4	4 single-ended outputs (unipolar)	Voltage: 0...10V Current: 4...20 mA	40 mA @ 5V DC 165 mA @ 24V DC	±1.0% full scale @ 0...55 °C (32...131 °F) ±0.5% full scale @ 25 °C (77 °F)	12 bits (unipolar)	2.5 ms
1762-IF2OF2	2 differential inputs (unipolar) 2 single-ended outputs (unipolar)	Voltage: 0...10V Current: 4...20 mA	40 mA @ 5V DC 105 mA @ 24V DC	±0.5% full scale @ 0...55 °C (32...131 °F) ±0.3% full scale @ 25 °C (77 °F)	12 bits (unipolar)	2.5 ms (inputs) 4.5 ms (outputs)

✶ Includes offset, gain, non-linearity, and repeatability error terms.
‡ Accuracy is dependent upon the Analog/Digital converter filter rate selection, excitation current selection, data format, and input noise.

Specialty I/O Modules

Cat. No.	Inputs/Outputs	Accepted Inputs	Bus Current Load, Max.	Accuracy @ 25 °C (77 °F)✶	Resolution Across Full Range	Channel Update Time (Typical)
1762-IR4	4 input channels	• RTDs: Platinum (385 and 3916), Copper (426), Nickel (672 and 618), Nickel-Iron (518) • Resistance Ranges: 0…3000 Ω	40 mA @ 5V DC 50 mA @ 24V DC	*With autocalibration enabled* • RTD Inputs: ±0.2…±0.6 °C (±0.36…±1.08 °F), depending on RTD type • Resistance Inputs: ±0.5…±1.5Ω, depending on resistance value	Input filter and configuration dependent§	6…303 ms per enabled channel, depending on filter selection
1762-IT4	4 input channels plus a CJC sensor	• Thermocouple Types: J, K, T, E, R, S, B, N, C • Millivolt Input Ranges: ±50 mV and ±100 mV	40 mA @ 5V DC 50 mA @ 24V DC	±1.3 °C (±2.34 °F)	15 bits plus sign	7…303 ms per enabled channel +CJC update time♣

✶ Includes offset, gain, non-linearity, and repeatability error terms.
§ Refer to the MicroLogix 1200 RTD/Resistance Input Module User Manual, publication 1762-UM003, for more information.
♣ CJC update time is equal to the largest enabled channel's update time.

Item # 09

Rockwell Automation

Memory and Real-Time Clock Modules

- User program and data backup
- Program compare
- Data file protection
- Memory module write protection
- Removal/insertion under power
- Memory backup and real-time clock combination module

Description	Cat. No.
Memory module	1762-MM1
Memory and real-time clock module	1762-MM1RTC
Real-time clock module	1762-RTC

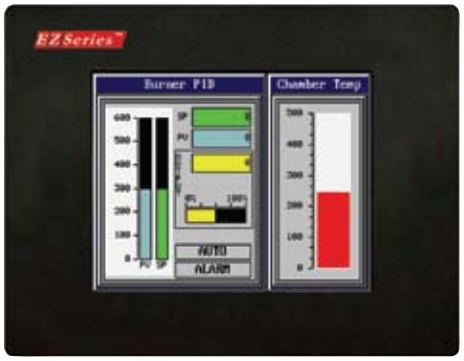
Item # 10

EZSeries 6" TFT Color Panels

6" Color EZSeries (5.7" TFT)

EZSeries 6" panels have a 5.7" diagonal touch screen with 320x240 pixel resolution. This model is a new addition to EZSeries line with a TFT LCD (liquid crystal display).

NOTE: EZSeries CE Touchpanels have built-in Ethernet yet are still available with additional Universal Ethernet option if the application needs multiple processors



EZSeries Touchpanel feature:

- 5.7" diagonal color TFT LCD
- Low-profile slim bezel design
- 128 colors
- NEMA 4, 4X
- 320x240 pixel resolution
- Non-expandable RAM
- 512K, 1MB or 2MB option flash card for memory backup
- 400 nits brightness
- 75,000 hour expected bulb half-life
- 192 touch cells (16x12)
- 1/4" gasket and four DIN mounting clips for NEMA 4, 4X
- 2.3" (59.0mm) installed depth
- Has all EZSeries objects
- Has all 4,000 Library symbols
- Programmed with EZSeries programming software

See the different communication interface options available in the chart to the right

EZSeries CE Touchpanel

Part Number	Description	Price	Del.
EZC-T6C-R	6" Color TFT, Enhanced CE 4.2 PP, Nema 4, 4X	$769	3DAY
EZC-T6C-ED	6" Color TFT, Enhanced CE 4.2 PP, DeviceNet, Nema 4, 4X	$2,299	3DAY
EZC-T6C-EH	6" Color TFT, Enhanced CE 4.2 PP, DH+, Nema 4, 4X	$1,899	3DAY
EZC-T6C-EM	6" Color TFT, Enhanced CE 4.2 PP, MB+, Nema 4, 4X	$1,899	3DAY
EZC-T6C-EP	6" Color TFT, Enhanced CE 4.2 PP, Profibus, Nema 4, 4X	$2,299	3DAY
EZC-T6C-EC	6" Color TFT, Enhanced CE 4.2 PP, CCLink, Nema 4, 4X	$1,899	3DAY
EZC-T6C-EU	6" Color TFT, Enhanced CE 4.2 PP, Universal Ethernet, Nema 4, 4X	$1,798	3DAY

Enhanced CE Touchpanels with Windows CE Professional Plus offer:

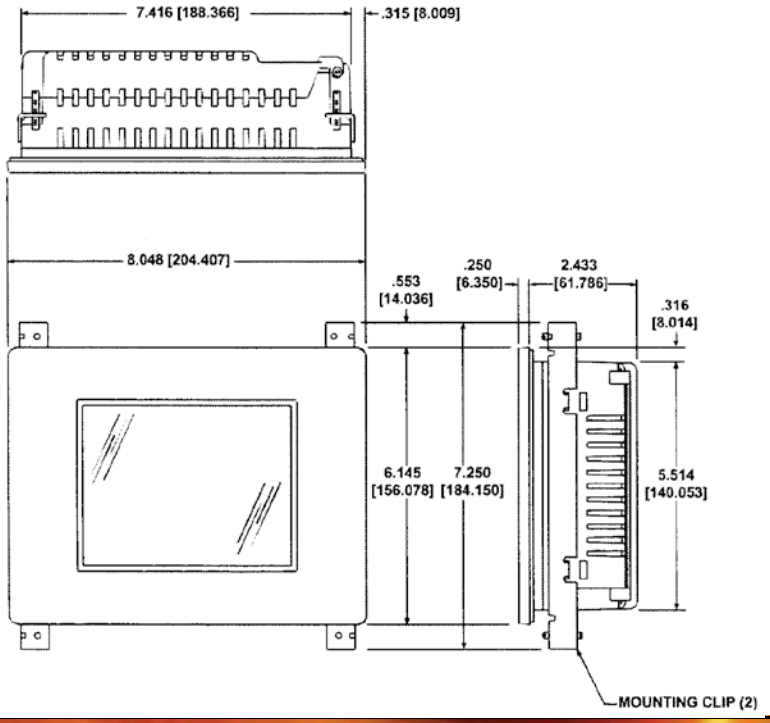
- File viewers such as Acrobat, Excel, Word, PowerPoint, Image and Internet Explorer for Windows CE
- Built-in Ethernet protocols, Ethernet IP, EZ IP, SRTP, Modbus TCP/IP and Koyo ECOM

EZSeries Dedicated OS

Model Number	Interface	Price	Del.
EZ-T6C-ES	EZPLC driver only	$769	STK
EZ-T6C-FS	All serial drivers and accepts Ethernet and network cards	$769	STK
EZ-T6C-FSD	DeviceNet	$1,499	3DAY
EZ-T6C-FSE	AB Ethernet I/P	$1,499	3DAY
EZ-T6C-FSH	DH+, Remote I/O	$1,499	3DAY
EZ-T6C-FSM	Modicon MODBUS Plus	$1,499	3DAY
EZ-T6C-FSP	Profibus	$1,499	3DAY
EZ-T6C-FST	MODBUS TCP/IP	$1,269	3DAY
EZ-T6C-FSC	CCLink	$1,499	3DAY
EZ-T6C-FSU	Universal Ethernet drivers - DF1, I/P, Modbus TCP/IP, SRTP	$1,398	3DAY
EZ-T6C-RMC	RMC card installed	$919	3DAY

EZSeries CE Touchpanel feature:

- 5.7" diagonal color TFT LCD
- Low-profile slim bezel design
- 18 bit colors
- NEMA 4, 4X
- 320x240 pixel resolution
- 400 nits brightness
- 75,000 hour expected bulb half-life
- Analog resistive touch screen
- Alchemy 333 MHz Processor
- 32MB Flash, 64MB RAM and 2 MB for HMI
- 1/4" gasket and four DIN mounting clips
- 2.43" installed depth
- Has all EZSeries Touchpanel
- Has all 4,000 Library symbols
- Programmed with EZSeries Programming software



EZSeries CE Touchpanel Selection Guide & Specifications

EZSeries CE Touchpanel 6-inch Model Specifications				
Part Number	Windows CE.NET 4.2 Professional Plus ***EZC-S6W-E*** (Full Featured) $399 ***EZC-S6W-EU*** (Universal Ethernet) $898	Windows CE.NET 4.2 Professional Plus ***EZC-S6M-E*** (Full Featured) $449 ***EZC-S6M-ED*** (DeviceNet) $1799 ***EZC-S6M-EH*** (DH+) $1399 ***EZC-S6M-EM*** (Modbus Plus) $1399 ***EZC-S6M-EP*** (Profibus) $1799 ***EZC-S6M-EC*** (CC Link) $1399 ***EZC-S6M-EU*** (Universal Ethernet) $1298	Windows CE.NET 4.2 Professional Plus ***EZC-S6C-E*** (Full Featured) $649 ***EZC-S6C-ED*** (DeviceNet) $1899 ***EZC-S6C-EH*** (DH+) $1499 ***EZC-S6C-EM*** (Modbus Plus) $1499 ***EZC-S6C-EP*** (Profibus) $1899 ***EZC-S6C-EC*** (CC Link) $1499 ***EZC-S6C-EU*** (Universal Ethernet) $1398	Windows CE.NET 4.2 Professional Plus EZC-T6C-R Featured) $769 ***EZC-T6C-ED*** (DeviceNet) $2299 ***EZC-T6C-EH*** (DH+) $1899 ***EZC-T6C-EM*** (Modbus Plus) $1899 ***EZC-T6C-EP*** (Profibus) $2299 ***EZC-T6C-EC*** (CC Link) $1899 ***EZC-T6C-EU*** (Universal Ethernet) $1798
				
Specification	6" white on blue	6" slim bezel gray scale	6" color slim bezel	
Display Type	5.7" STN (White on Blue)	5.7" STN (Monochrome)	5.7" STN (18 bit colors)	5.7" TFT (18 bit colors)
Enclosure	NEMA 4, 4X			
Display View Area	4.72"x3.5" (119.4x88.9 mm)		4.65"x3.5" (118.1 x 88.9mm)	
Screen Pixels	320x240			
Brightness/Life	140 nits/50,000 hours		200 nits/40,000 hours	400 nits/75,000 hours
Touch Screen	Analog Resistive Touch Screen			
CPU Type	AMD 333 MHz 32 Bit CPU			
Service Power	24VDC (20-30VDC operating range), 1.2A switching supply recommended		24VDC (20-30VDC operating range), 1.5A switching supply recommended	
Power	10 watts @ 24VDC	12 watts @ 24VDC	13 Watts @ 24VDC	15 Watts @ 24VDC
Agency Approval	UL, CUL, CE pending			
Operating Temp.	0 to 45°C		0 to 50°C	0° to 55°C
Storage Temp.	-20° to 65°C			
Humidity	10-95% RH, noncondensing			
Electrical Noise	NEMA ICS 2-230 showering arc ANSI C37.90a-1974 SWC Level C Chattering Relay Test			
Withstand Voltage	1000VDC (1 minute), between power supply input terminal and protective ground (FG)			
Insulation Res.	Over 20 MΩ, between power supply input and terminal and protective ground (FG)			
Vibration	5 to 55Hz 3G for 2 hours in the X, Y and Z axes			
Shock	20G for under 12ms in the X, Y and Z axes			
User Memory	32 MB Built-in Flash; 64 MB RAM; Optional Compact Flash Card for Memory Backup/Transfer			
Num. of Screens	Up to 999 limited by memory			
Real Time Clock	Built into panel (PLC clock is still accessible if available)			
Screen Saver	Yes, Backlight off			
Serial Communications	PLC port: RS-232/RS-422/RS-485 15-pin D-sub (female) Download/program port: RS-232/RS-422/RS-485 9-pin D-sub (female) Optional Ethernet with Ethernet IP, EZ IP, Modbus TCP/IP, SRTP, Koyo ECOM and TCP/IP for Programming For Universal Ethernet model 15 D-sub is replaced by Universal Ethernet port			
External Dimensions	6.145"x8.048"x2.433" (156.078x204.407x51.786mm)			
Weight	1.7 lbs			

EZSeries CE Touchpanel Selection Guide and Specifications

EZSeries CE Touchpanel 8, 10 and 15-inch Model Specifications				
Part Number	Windows CE.NET 4.2 Professional Plus ***EZC-S8C-E*** (Full Featured) $849 ***EZC-S8C-ED*** (DeviceNet) $2399 ***EZC-S8C-EH*** (DH+) $1999 ***EZC-S8C-EM*** (Modbus Plus) $1999 ***EZC-S8C-EP*** (Profibus) $2399 ***EZC-S8C-EC*** (CC Link) $1999 ***EZC-S8C-EU*** (Universal Ethernet) $1898	Windows CE.NET 4.2 Professional Plus ***EZC-T8C-E*** (Full Featured) $949 ***EZC-T8C-ED*** (DeviceNet) $2599 ***EZC-T8C-EH*** (DH+) $2199 ***EZC-T8C-EM*** (Modbus Plus) $2199 ***EZC-T8C-EP*** (Profibus) $2599 ***EZC-T8C-EC*** (CC Link) $2199 ***EZC-T8C-EU*** (Universal Ethernet) $2098	Windows CE.NET 4.2 Professional Plus ***EZC-T10C-E*** (Full Featured) $1499 ***EZC-T10C-ED*** (DeviceNet) $2899 ***EZC-T10C-EH*** (DH+) $2499 ***EZC-T10C-EM*** (Modbus Plus) $2499 ***EZC-T10C-EP*** (Profibus) $2899 ***EZC-T10C-EC*** (CC Link) $2499 ***EZC-T10C-EU*** (Universal Ethernet) $2398	Windows CE.NET 4.2 Professional Plus ***EZC-T15C-E*** (Full Featured) $2199 ***EZC-T15C-ED*** (DeviceNet) $3699 ***EZC-T15C-EH*** (DH+) $3299 ***EZC-T15C-EM*** (Modbus Plus) $3299 ***EZC-T15C-EP*** (Profibus) $3699 ***EZC-T15C-EC*** (CC Link) $3299 ***EZC-T15C-EU*** (Universal Ethernet) $3198
				
Specification	8" color slim bezel		10" color slim bezel	15" color slim bezel
Display Type	8.2" STN (18 bit colors)	8" TFT (18 bit colors)	10.4" TFT (18 bit colors)	15.0" TFT (18 bit colors)
Enclosure	NEMA 4, 4X			
Display View Area	6.65"x5.024" (168.9x127.61 mm)	6.05"x4.55" (153.7x115.8 mm)	8.31"x6.22" (211.07 x 158mm)	12.02"x9.01" (305.28 x 228.96mm)
Screen Pixels	640x480			1024x768
Brightness/Life	140 nits/25,000 hours	370 nits/54,000 hours	400 nits/50,000 hours	250 nits/55,000 hours
Touch Screen	Analog Resistive Touch Screen			
CPU Type	AMD 333 MHz 32-bit CPU			
Service Power	24VDC (20-30VDC operating range), 1.5A switching supply recommended			
Power	16 Watts @ 24VDC		18 Watts @ 24VDC	20 Watts @ 24VDC
Agency Approval	UL, CUL, CE (pending)			
Operating Temp.	0 to 50°C (32 to 122°F)	0° to 55°C (32 to 131°F)	0° to 55°C (32 to 131°F)	0° to 55°C
Storage Temp.	-20° to 65°C			
Humidity	10-95% RH, noncondensing			
Electrical Noise	NEMA ICS 2-230 showering arc ANSI C37.90a-1974 SWC Level C Chattering Relay Test			
Withstand Voltage	1000VDC (1 minute), between power supply input terminal and protective ground (FG)			
Insulation Res.	Over 20 MΩ, between power supply input and terminal and protective ground (FG)			
Vibration	5 to 55Hz 3G for 2 hours in the X, Y and Z axes			
Shock	20G for under 12ms in the X, Y and Z axes			
User Memory	32 MB Built-in Flash; 64 MB RAM			
Num. of Screens	Up to 999 limited by memory			
Real Time Clock	Built into panel (PLC clock is still accessible if available)			
Screen Saver	Yes, Backlight off			
Serial Communications	PLC port: RS-232/RS-422/RS-485 15-pin D-sub (female)			
	Download/program port: RS-232/RS-422/RS-485 9-pin D-sub (female)			
	Optional Ethernet with Ethernet IP, EZ IP, Modbus TCP/IP, SRTP, Koyo ECOM and TCP/IP for Programming			
	For Universal Ethernet model 15 D-sub is replaced by Universal Ethernet port			
External Dimensions	8.748"x10.894"x2.289" (222.199x276.708x58.136mm)		10.59"x13.58"x2.86" (268.99x344.93x72.64mm)	13.00"x16.75"x4.66" (330.2 x 425.45 x 118.36mm)
Weight	2.9 lbs		3.8 lbs	7 lbs

EZTouch Cables and Wiring

Power connector

A block style connector is used to connect an external 24VDC power supply. You can use our own FA-24PS 24VDC power supply as your source.

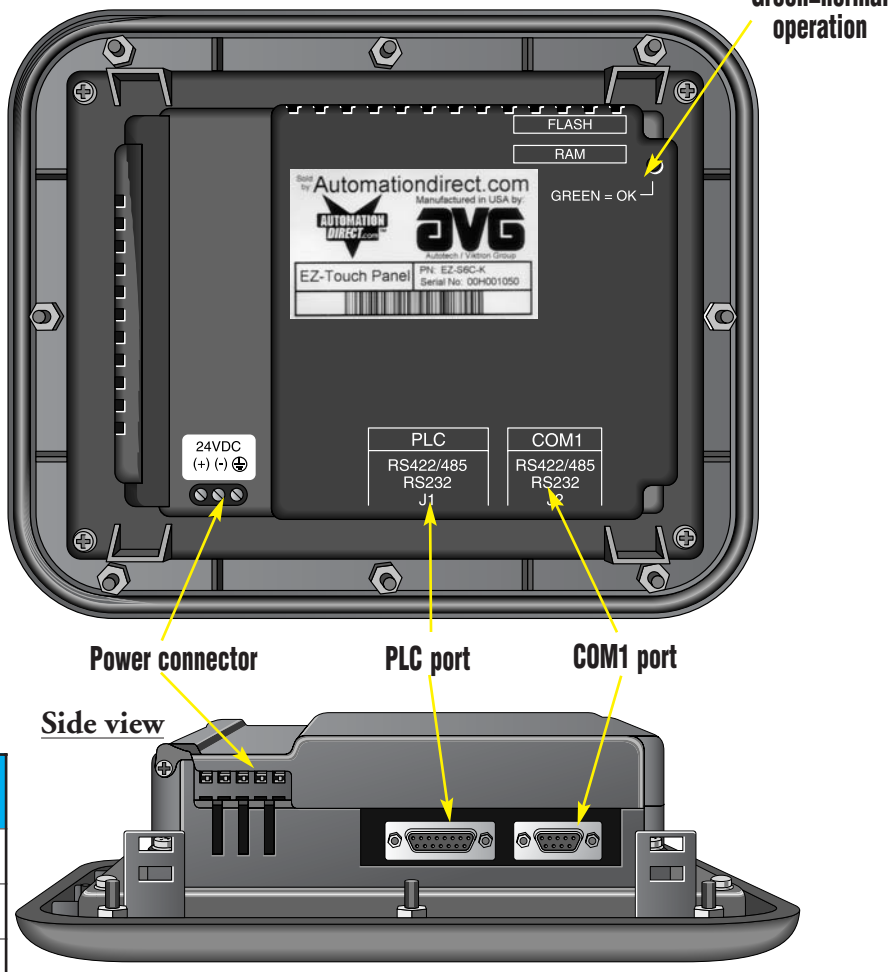
Power Connector		
Pin #	*Connection*	
+	+V	24VDC (20-30VDC)
-	-V	
⏚	Chassis Ground	

PLC port

The PLC port is a RS-232C, RS-422A or RS-485A female 15-pin D-sub connector. See the table below for the appropriate cable for your application.

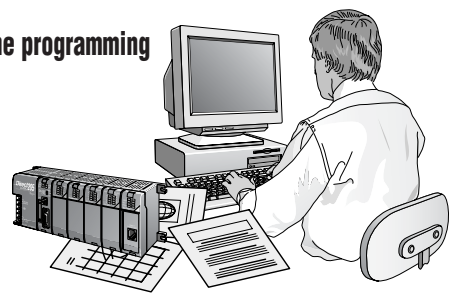
COM 1 port

RS-232C, RS-422A, or RS-485A female 9-pin D-sub connector is used to connect to the programming computer or PLC.



Cable Part Number	Cable Description	Price
EZ-2CBL	*DirectLOGIC* PLC RJ-12	$19.00
EZ-2CBL-1	*DirectLOGIC* VGA 15-pin (D2-250)	$19.00
EZ-3CBL	*DirectLOGIC* PLC RJ-11	$19.00
EZ-4CBL-1	*DirectLOGIC* DL405 PLC 15-pin D-sub port	$19.00
EZ-4CBL-2	*DirectLOGIC* PLC 25-pin D-sub port	$19.00
EZ-MLOGIX-CBL	Allen-Bradley MicroLogix	$19.00
EZ-SLC-232-CBL	Allen-Bradley SLC 5-03/04/05DF1 port	$19.00
EZPLC5-232-CBL	Allen-Bradley PLC-5 DF1 port	$19.00
EZ-DH485-CBL	Allen-Bradley SLC 500 DH485	$19.00
EZ-90-30-CBL	GE 90/30 and 90/70 15 pin D-sub	$19.00
EZ-MITSU-CBL	MITSUBISHI FX24 25-pin	$19.00
EZ-MITSU-CBL-1	MITSUBISHI FX24 8-pin mini-DIN	$19.00
EZ-S7MPI-CBL	Siemens S7 MPI adapter 9-pin D-sub	$19.00
EZTOUCH-PGMCBL	Programming cable	$19.00

Setup for online programming



PLC Connector	
Pin Number	*Connection*
1	Chassis GND
2	PLC TXD (RS-232)
3	PLC RXD (RS-232)
4	+5V
5	Logic GND
6	LE
7	PLC CTS (RS-232)
8	PLC RTS (RS-232)
9	RXD+ (RS-422)
10	RXD- (RS-422)
11	TXD+ (RS-422)
12	TXD- (RS-422)
13	Terminating resistor
14	NC
15	NC

COM 1 Connector	
Pin Number	*Connection*
1	TXD- (RS-422)
2	TXD (RS-232)
3	RXD (RS-232)
4	RXD- (RS-422)
5	Logic GND
6	TXD+ (RS-422)
7	CTS (RS-232)
8	RTS (RS-232)
9	RXD+ (RS-422)

Item # 12

IT'S EASY TO BUILD YOUR OWN PILOT LIGHT

Simply pick the code number from each of the sections below and combine them to build your part number. See page 2 for more detailed directions.

Pilot Lights

I	II	III	IV	– PLL V	VI

Example: To build one of our most popular Pilot Lights, the part number would be I + II + III + IV + PLL + VI or FVLU120LG-PLLGN

I. BASIC PILOT LIGHT OPERATOR

CODE	DESCRIPTION	LIST
FVLU	Full Voltage	$26.00
TFLU	Transformer (50/60 Hz)	$38.00
RLU	Resistor	$32.00
RTLU	Dual Input Remote Test	$35.00

II. VOLTAGE BASED ON OPERATOR TYPE

CODE	DESCRIPTION
	FULL VOLTAGE
6	6V AC/DC
12	12V AC/DC
24	24V AC/DC
120	120V AC/DC
	TRANSFORMER
120	120V AC
240	240V AC
277	277V AC
480	480V AC
	RESISTOR
120	120V AC/DC
240	240V AC/DC
480	480V AC/DC
	DUAL INPUT REMOTE TEST
6	6V AC/DC
12	12V AC/DC
24	24V AC/DC
120	120V AC/DC
240	240V AC/DC

III. LAMP TYPE/COLOR

CODE	COLOR	LIST
	LED	
LA	Amber	$10.00
LB	Blue	$10.00
LG	Green	$10.00
LR	Red	$10.00
LW	White	$10.00
	INCANDESCENT	
(Blank)	Clear	—
F	Clear Flashing Bulb NOTE: Incandescent flashing bulbs available for any 6V full voltage or transformer application.	$ 4.00
	NEON*	
NG	Green	—
NR	Red	—
	*NOTE: Only Available in FVLU120, RLU240 and RLU480.	
NL	**No Lamp**	– $ 1.00

IV. CLAMP RING

CODE	DESCRIPTION	LIST
(Blank)	Polyester (Type 4X)	—
A	Aluminum (Type 4)	$2.00

V. LENS TYPE

CODE	DESCRIPTION	LIST
PLL	Pilot Light Lens	$6.00

VI. LENS COLOR

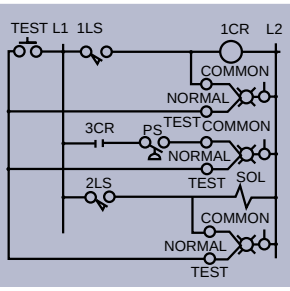
CODE	COLOR
AR	Amber
BE	Blue
CR	Clear
GN	Green
RD	Red
WE	White

SEE PAGE 31 FOR LAMP TECHNICAL DATA AND LAMP REPLACEMENT CHARTS.

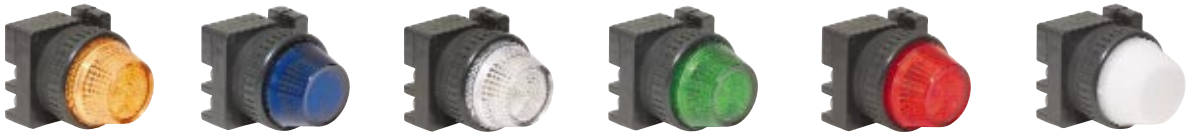
DISCOUNT SCHEDULE A

DUAL INPUT REMOTE TEST

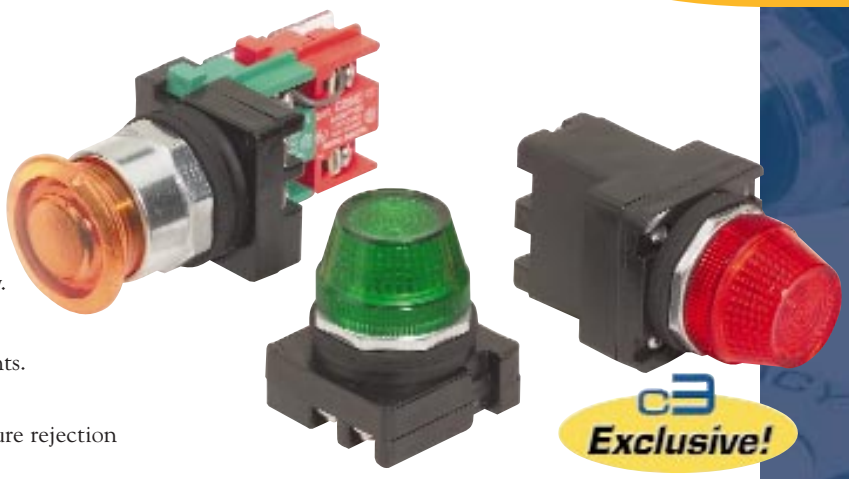
Our unique Dual Input Remote light unit can be used as a pilot light while also permitting the testing of a number of lights from a single push button. A diode circuit isolates the test supply from the normal supply. The schematic shown represents a typical dual input application.



AVAILABLE LENS COLORS FOR PILOT LIGHTS



30mm Pilot Lights



Our 30mm Pilot Lights and Illuminated Push-To-Test Pilot Lights, when utilized with our LED lamps provide long-lasting life and high quality with tremendous resistance to shock and vibration. Our reflection technology and state-of-the-art LED lamps improve visibility from all angles. c3controls LED lamps last 100,000 hours — *that's 11.4 years!* Combine these LEDs with our full voltage, transformer or resistor packages for optimum durability. All c3controls 30mm operators are UL Listed and are rated Type 4/4X standard for watertight and corrosion resistance. In addition, operators are also listed for Types 1, 2, 3, 3R, 12 and 13 requirements.

Product features include:

- Polyester construction for superior corrosion resistance, moisture rejection and electrical insulation.
- Full voltage lights incorporate a unique insulated socket design to minimize accidental contact during lamp change.
- All lights use miniature bayonet base lamps to provide reliable lamp secureness.
- #6 terminal screws with self-lifting captive wire clamps accommodate #22 through two #12 AWG wires per terminal.
- Operators conveniently mount in a round 30mm or 1-13/64" hole that is directly interchangeable with competitors units and eliminates the labor required for notching.

c3 Exclusive!

Multi-Voltage Light!
See page 23

UNIQUE PRODUCT FEATURES

1. Compact, thin design is also vibration resistant.
2. Our seal is infused with a coating to eliminate cracking when exposed to harsh conditions such as heat, dryness and sunlight. This seal also acts as a light reflector because it is white which increases light output and improves visibility from all angles.
3. Our rugged lenses provide better visibility and can resist high impact for reliable performance in most environments, even in high temperature ambients.
4. We utilize a premium 130V incandescent lamp for improved, long-lasting life.

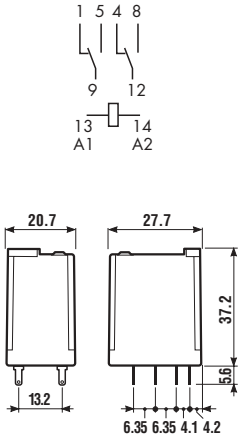
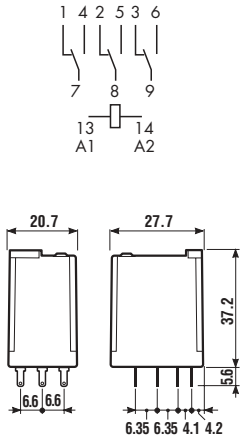
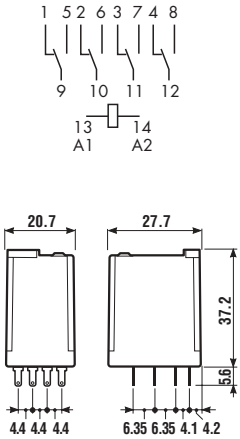
Some of Our Popular Configurations:

PILOT LIGHTS WITH POLYESTER CLAMP RING (TYPE 4X)

CATALOG NUMBER	DESCRIPTION	LIST
FVLU120LG-PLLGN	Full Voltage 120V Green LED w/Green Lens	$42.00
FVLU120LR-PLLRD	Full Voltage 120V Red LED w/Red Lens	$42.00
FVLU120LA-PLLAR	Full Voltage 120V Amber LED w/Amber Lens	$42.00

55 Series - Miniature general purpose relays 7 - 10 A

- *Plug-in versions*
- *AC or DC coils*
- *Lockable test button and mechanical flag indicator as standard on 2 and 4 CO (DPDT and 4PDT) relays types*
- *Sockets and accessories: see 94, 99 and 86 series*

	55.32	55.33	55.34
			
	- 2 pole, 10 A - Plug-in for use with 94 series sockets	- 3 pole, 10 A - Plug-in for use with 94 series sockets	- 4 pole, 7 A - Plug-in for use with 94 series sockets
			
Contact specifications			
Contact configuration	2 CO (DPDT)	3 CO (3PDT)	4 CO (4PDT)
Rated current/Maximum peak current A	10/20	10/20	7/15
Rated voltage/Maximum switching voltage V AC	250/400	250/400	250/250
Rated load in AC1 VA	2,500	2,500	1,750
Rated load in AC15 (230 V AC) VA	500	500	350
Single phase motor rating (230 V AC) kW	0.37	0.37	0.125
Breaking capacity in DC1: 30/110/220 V A	10/0.25/0.12	10/0.25/0.12	7/0.25/0.12
Minimum switching load mW (V/mA)	300 (5/5)	300 (5/5)	300 (5/5)
Standard contact material	AgNi	AgNi	AgNi
Coil specifications			
Nominal voltage (U_N) V AC (50/60 Hz)	6 - 12- 24 - 48 - 60 - 110 - 120 - 230 - 240		
V DC	6 - 12 - 24 - 48 - 60 - 110 - 125 - 220		
Rated power AC/DC VA (50 Hz)/W	1.5/1	1.5/1	1.5/1
Operating range AC	(0.8...1.1)U_N	(0.8...1.1)U_N	(0.8...1.1)U_N
DC	(0.8...1.1)U_N	(0.8...1.1)U_N	(0.8...1.1)U_N
Holding voltage AC/DC	0.8 U_N/0.5 U_N	0.8 U_N/0.5 U_N	0.8 U_N/0.5 U_N
Must drop-out voltage AC/DC	0.2 U_N/0.1 U_N	0.2 U_N/0.1 U_N	0.2 U_N/0.1 U_N
Technical data			
Mechanical life AC/DC cycles	20 · 10^6/50 · 10^6	20 · 10^6/50 · 10^6	20 · 10^6/50 · 10^6
Electrical life at rated load AC1 cycles	200 · 10^3	200 · 10^3	150 · 10^3
Operate/release time ms	9/3	9/3	9/3
Insulation according to EN 61810-1 ed. 2	3.6 kV/2	3.6 kV/2	2.5 kV/2
Insulation between coil and contacts (1.2/50 µs) kV	3.6	3.6	3.6
Dielectric strength between open contacts V AC	1,000	1,000	1,000
Ambient temperature range °C	–40...+85	–40...+85	–40...+85
Environmental protection	RT I	RT I	RT I
Approvals (according to type):	CE ABS GOST IRAM RINA cULus NF VDE		

ORDERING INFORMATION

Example: a 55 series plug-in relay, 4 CO (4PDT) contacts, coil rated 12 V DC with a lockable test button and mechanical indicator.

5 5	.	3	4	.	9	.	0 1 2	.	A 0	B 0	C 4	D 0

Series

Type
1 = P.C.B.
3 = Plug-in

No. of poles
2 = 2 pole, 10 A
3 = 3 pole, 10 A
4 = 4 pole, 7 A

Coil version
8 = AC (50/60 Hz)
9 = DC

Coil voltage
see coil specifications

A: Contact material
0 = Standard AgNi
2 = AgCdO
5 = AgNi + Au (5 µm)

B: Contact circuit
0 = CO (nPDT)

D: Special versions
0 = Standard
1 = Wash tight (RT III)
for 55.12, 55.13 and 55.14 only
6 = Rear flange mount

C: Options
0 = None
1 = Lockable test button
2 = Mechanical indicator
3 = LED (AC)
4 = Lockable test button + mechanical indicator
5 = Lockable test button + LED (AC)
54 = Lockable test button + LED (AC) + mechanical indicator
6 = Double LED (DC not polarized)
7 = Lockable test button + double LED (DC not polarized)
74 = Lockable test button + double LED (DC not polarized) + mechanical indicator
8 = LED + diode (positive to pin A1/13, DC standard polarity)
9 = Lockable test button + LED + diode (positive to pin A1/13, DC standard polarity)
94 = Lockable test button + LED + diode (positive to pin A1/13, DC standard polarity) + mechanical indicator

Only combinations in the same row are possible

Preferred versions

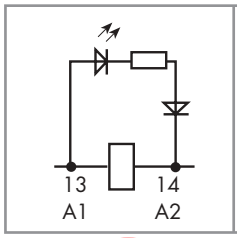
	coil version	A	B	C	D
55.32/34	AC/DC	0	0	4	0
55.12/13/14	AC/DC	0	0	0	0
55.33	AC/DC	0	0	0	0

All versions

	coil version	A	B	C	D
55.32/34	AC/DC	0 - 2 - 5	0	0	0 - 6
	AC	0 - 2 - 5	0	2 - 3 - 4 - 5	0 - 6
	AC	0 - 2 - 5	0	54	/
	DC	0 - 2 - 5	0	2 - 4 - 6 - 7 - 8 - 9	0 - 6
	DC	0 - 2 - 5	0	74 - 94	/
55.33	AC/DC	0 - 2 - 5	0	0	0 - 6
	AC	0 - 2 - 5	0	1 - 3 - 5	0 - 6
	DC	0 - 2 - 5	0	1 - 6 - 7 - 8 - 9	0 - 6
55.12/13/14	AC/DC	0 - 2 - 5	0	0	0 - 1

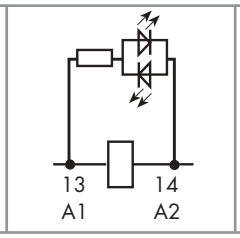
POSSIBLE OPTIONS

AC



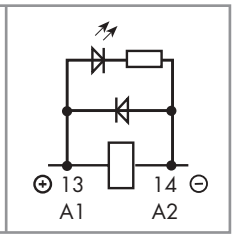
Option = 0030
0050
0054

DC - Not polarized

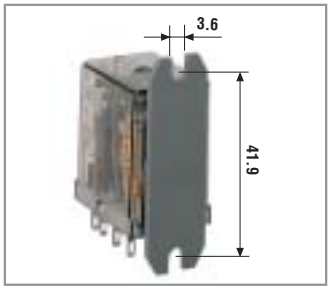


Option = 0060
0070
0074

DC - Standard polarity



Option = 0080
0090
0094



Option = 0006
REAR FLANGE MOUNT

LOCKABLE TEST BUTTON AND MECHANICAL FLAG INDICATOR (0040)

The dual-purpose Finder test button can be used in two ways:

Case 1) The plastic pip (located directly above the test button) remains intact. In this case, when the test button is pushed, the contacts operate. When the test button is released the contacts return to their former state.

Case 2) The plastic pip is broken-off (using an appropriate cutting tool). In this case, (in addition to the above function), when the test button is pushed and rotated, the contacts are latched in the operating state, and remain so until the test button is rotated back to its former position.

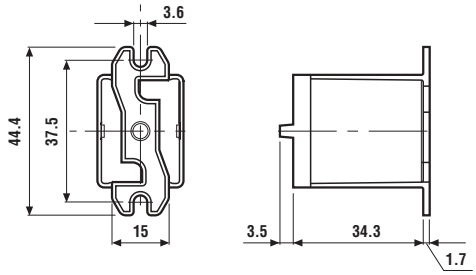
In both cases ensure that the test button actuation is swift and decisive.

ACCESSORIES


055.05


055.05 with relays

Adaptor with top mount flange for 55.32, 55.33, 55.34	055.05



55

TECHNICAL DATA

INSULATION

Insulation according to EN 61810-1 ed. 2		insulation rated voltage V	400 (2-3 pole)	250 (4 pole)
		rated impulse withstand voltage kV	3.6 (2-3 pole)	2.5 (4 pole)
		pollution degree	2	
		overvoltage category	III	
		2 CO (DPDT)	**3 CO (3PDT)**	**4 CO (4PDT)**
Dielectric strength between adjacent contact	V AC	2,000	2,000	1,550

CONDUCTED DISTURBANCE IMMUNITY

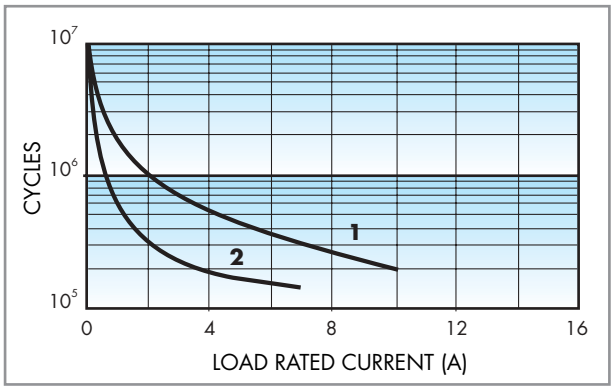
Burst (5...50)ns, 5 kHz, on A1 - A2	EN 61000-4-4	level 4 (4 kV)
Surge (1.2/50 µs) on A1 - A2 (differential mode)	EN 61000-4-5	level 4 (4 kV)

OTHER DATA

Bounce time: NO/NC	ms	1/4		
Vibration resistance (10...55)Hz, max. ± 1 mm: NO/NC	g/g	6/6		
Power lost to the environment		**2 CO (DPDT)**	**3 CO (3PDT)**	**4 CO (4PDT)**
without contact current	W	1	1	1
with rated current	W	3	4	3
Recommended distance between relays mounted on P.C.B.s	mm	≥ 5		

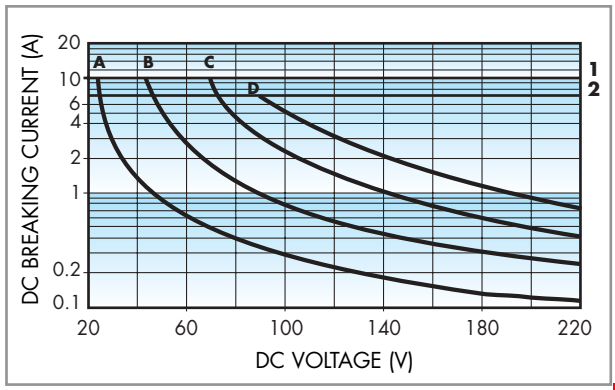
CONTACT SPECIFICATIONS

F 55



Electrical life vs AC1 load.
1 - 2 - 3 CO (DPDT - 3PDT) relay type (10 A)
2 - 4 CO (4PDT) relay type (7 A)

H 55



Breaking capacity for DC1 load.
1 - 2 - 3 CO (DPDT - 3PDT) type
2 - 4 CO (4PDT) type
A - Load applied to 1 contact
B - Load applied to 2 contacts in series
C - Load applied to 3 contacts in series
D - Load applied to 4 contacts in series

• When switching a resistive load (DC1) having voltage and current values under the curve the expected electrical life is ≥ $100 \cdot 10^3$ cycles.
• In case of DC13 loads the connection of a diode in parallel with the load will permit the same electrical life as for a DC1 load.
Note: the release time of load will be increase.

55

COIL SPECIFICATIONS

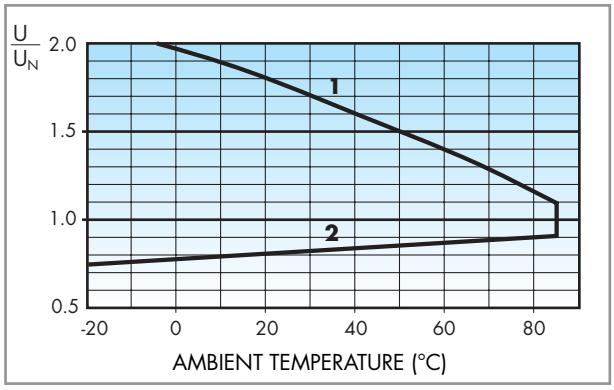
DC VERSION DATA

Nominal voltage U_N	Coil code	Operating range U_{min}	Operating range U_{max}	Resistance R	Rated coil consumption I at U_N
V		V	V	Ω	mA
6	**9**.006	4.8	6.6	40	150
12	**9**.012	9.6	13.2	140	86
24	**9**.024	19.2	26.4	600	40
48	**9**.048	38.4	52.8	2,400	20
60	**9**.060	48	66	4,000	15
110	**9**.110	88	121	12,500	8.8
125	**9**.125	100	137.5	17,300	7.2
220	**9**.220	176	242	54,000	4

AC VERSION DATA

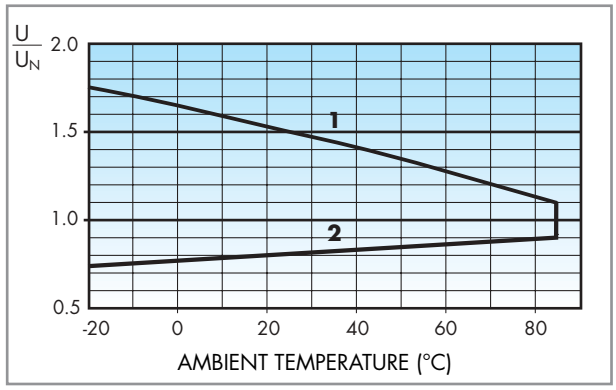
Nominal voltage U_N	Coil code	Operating range U_{min}	Operating range U_{max}	Resistance R	Rated coil consumption I at U_N (50Hz)
V		V	V	Ω	mA
6	**8**.006	4.8	6.6	12	200
12	**8**.012	9.6	13.2	50	97
24	**8**.024	19.2	26.4	190	53
48	**8**.048	38.4	52.8	770	25
60	**8**.060	48	66	1,200	21
110	**8**.110	88	121	4,000	12.5
120	**8**.120	96	132	4,700	12
230	**8**.230	184	253	17,000	6
240	**8**.240	192	264	19,100	5.3

R 55 DC



Operating range (DC type) vs ambient temperature.
1 - Max coil voltage permitted.
2 - Min pick-up voltage with coil at ambient temperature.

R 55 AC



Operating range (AC type) vs ambient temperature.
1 - Max coil voltage permitted.
2 - Min pick-up voltage with coil at ambient temperature.

94.04

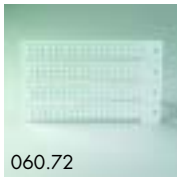
Approvals (according to type):

Relay type	55.32		55.33		55.32, 55.34	
Colour	BLUE	BLACK	BLUE	BLACK	BLUE	BLACK
Clamp terminal socket: panel or 35 mm rail (EN 50022) mount retaining clip 094.01 supplied with socket packaging code SPA	94.02	94.02.0	94.03	94.03.0	94.04	94.04.0
Metal retaining clip	094.71					
Plastic retaining and release clip	094.01					
6-way jumper link for 94.02, 94.03 and 94.04 sockets	094.06	094.06.0	094.06	094.06.0	094.06	094.06.0
Identification tag	094.00.4					
Modules (see table below)	99.02					
Timer modules (see table below)	86.10, 86.20					
Sheet of marker tags for retaining and release clip 094.01	060.72					

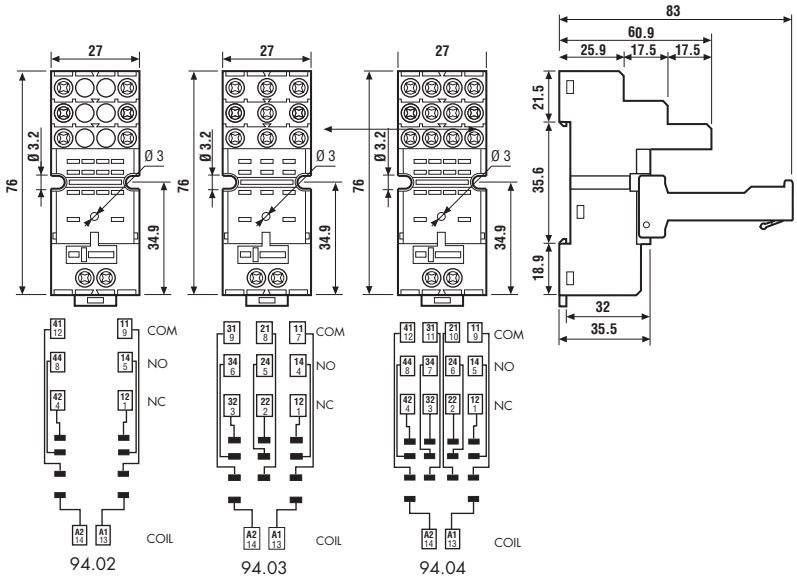
- Rated values: 10 A - 250 V
- Dielectric strength: ≥ 2 kV AC
- Protection category: IP 20
- Ambient temperature: (–40...+70)°C
- Screw torque: 0.5 Nm
- Wire strip length: 8 mm
- Max wire size:

	solid wire	stranded wire
mm²	1x6 / 2x2.5	1x4 / 2x2.5
AWG	1x10 / 2x14	1x12 / 2x14

094.01



060.72

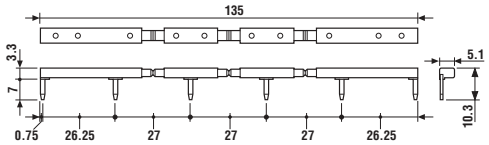


FOR 94.02, 94.03 AND 94.04 SOCKETS:

094.06

6-way jumper link	094.06

- Rated values: 10 A - 250 V



86.10

86 series module timers (see technical data pages 151/155)	BLUE
Mono-function: (12...24)V AC/DC; function AI; (1.5s...60min)	86.10.0.024.0000
Mono-function: (12...24)V AC/DC; function DI; (1.5s...60min)	86.20.0.024.0000

Approvals (according to type): GOST

99.02

Approvals (according to type): GOST

99.02 coil indication and EMC suppression modules (see technical data page 209)		BLUE*
Diode** (+A1, standard polarity)	(6...220)V DC	99.02.3.000.00
Diode (+A2, non standard polarity)	(6...220)V DC	99.02.2.000.00
LED	(6...24)V DC/AC	99.02.0.024.59
LED	(28...60)V DC/AC	99.02.0.060.59
LED	(110...240)V DC/AC	99.02.0.230.59
LED + Diode** (+A1, standard polarity)	(6...24)V DC	99.02.9.024.99
LED + Diode** (+A1, standard polarity)	(28...60)V DC	99.02.9.060.99
LED + Diode** (+A1, standard polarity)	(110...220)V DC	99.02.9.220.99
LED + Diode (+A2, non standard polarity)	(6...24)V DC	99.02.9.024.79
LED + Diode (+A2, non standard polarity)	(28...60)V DC	99.02.9.060.79
LED + Diode (+A2, non standard polarity)	(110...220)V DC	99.02.9.220.79
LED + Varistor	(6...24)V DC/AC	99.02.0.024.98
LED + Varistor	(28...60)V DC/AC	99.02.0.060.98
LED + Varistor	(110...240)V DC/AC	99.02.0.230.98
RC circuit	(6...24)V DC/AC	99.02.0.024.09
RC circuit	(28...60)V DC/AC	99.02.0.060.09
RC circuit	(110...240)V DC/AC	99.02.0.230.09
Residual current by-pass (62 kΩ/1W)	(110...240)V AC	99.02.8.230.07

* Modules in Black housing are available on request.

**For DC supply, apply the positive to terminal A1.

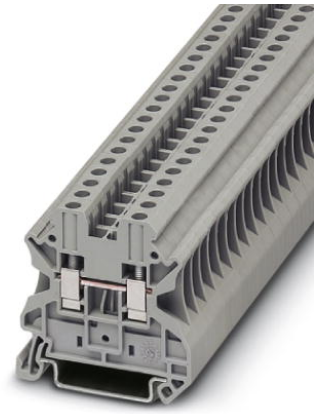
Item # 15

PHOENIX CONTACT

Extract from the online catalog

UT 4

Order No.: 3044102



http://eshop.phoenixcontact.de/phoenix/treeViewClick.do?UID=3044102

Universal terminal block with screw connection, cross section: 0,14 - 4 mm², AWG: 26 - 10, width: 6.2 mm, color: Gray

Product notes

WEEE/RoHS-compliant since: 01/01/2003

Commercial data	
EAN	4017918960391
Pack	50 Pcs.
Customs tariff	85369010
Weight/Piece	0.009424 KG
Catalog page information	Page 27 (CL-2007)

http://www.download.phoenixcontact.com
Please note that the data given here has been taken from the online catalog. For comprehensive information and data, please refer to the user documentation. The General Terms and Conditions of Use apply to Internet downloads.

Technical data

General

Number of levels	1
Number of connections	2
Color	gray

Insulating material	PA
Inflammability class acc. to UL 94	V0

Dimensions

Width	6.2 mm
Length	47.7 mm
Height NS 35/7,5	47.5 mm
Height NS 35/15	55 mm

Technical data

Maximum load current	41 A (with 6 mm^2 conductor cross section)
Rated surge voltage	8 kV
Pollution degree	3
Surge voltage category	III
Insulating material group	I
Connection in acc. with standard	IEC 60947-7-1
Nominal current I_N	32 A (with 4 mm^2 conductor cross section)
Nominal voltage U_N	1000 V
Open side panel	ja

Connection data

Conductor cross section solid min.	0.14 mm^2
Conductor cross section solid max.	6 mm^2
Conductor cross section stranded min.	0.14 mm^2
Conductor cross section stranded max.	6 mm^2
Conductor cross section AWG/kcmil min.	26
Conductor cross section AWG/kcmil max	10
Conductor cross section stranded, with ferrule without plastic sleeve min.	0.25 mm^2
Conductor cross section stranded, with ferrule without plastic sleeve max.	4 mm^2
Conductor cross section stranded, with ferrule with plastic sleeve min.	0.25 mm^2
Conductor cross section stranded, with ferrule with plastic sleeve max.	4 mm^2
2 conductors with same cross section, solid min.	0.14 mm^2
2 conductors with same cross section, solid max.	1.5 mm^2

2 conductors with same cross section, stranded min.	0.14 mm^2
2 conductors with same cross section, stranded max.	1.5 mm^2
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, min.	0.5 mm^2
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, max.	2.5 mm^2
2 conductors with same cross section, stranded, ferrules without plastic sleeve, min.	0.25 mm^2
2 conductors with same cross section, stranded, ferrules without plastic sleeve, max.	1.5 mm^2
Type of connection	Screw connection
Stripping length	9 mm
Internal cylindrical gage	A4
Screw thread	M 3
Tightening torque, min	0.6 Nm
Tightening torque max	0.8 Nm

Certificates / Approvals

CSA

Nominal voltage U_N	600 V
Nominal current I_N	30 A
AWG/kcmil	26-10

CUL

Nominal voltage U_N	600 V
Nominal current I_N	30 A
AWG/kcmil	26-10

UL

Nominal voltage U_N	600 V
Nominal current I_N	30 A
AWG/kcmil	26-10
Certification	CB, CSA, CUL, DNV, GL, LR, UL, VDE-PZI

requested approbations

Certification Ex:	IECEx, KEMA-EX

Accessories

Item	Designation	Description
Assembly		
3047167	ATP-UT	Partition plate, for visual and electrical separation of terminal groups, width: 2 mm, color: gray
3047028	D-UT 2,5/10	Cover, for terminal block UT and UT...-PE, width 2.2 mm, color: Gray
0801762	NS 35/ 7,5 CU UNPERF 2000MM	DIN rail, material: Copper, unperforated, height 7.5 mm, width 35 mm, length: 2 m
1207640	NS 35/ 7,5 PERF 755MM	NS 35 DIN rail, height 7.5 mm, length 755 mm
1207653	NS 35/ 7,5 PERF 955MM	NS35 DIN rail, height 7.5 mm, length 955 mm
1207666	NS 35/ 7,5 PERF 1155MM	NS 35 DIN rail, height 7.5 mm, length 1155 mm
0801733	NS 35/ 7,5 PERF 2000MM	DIN rail, material: Steel, perforated, height 7.5 mm, width 35 mm, length: 2 m
0801681	NS 35/ 7,5 UNPERF 2000MM	DIN rail, material: Steel, unperforated, height 7.5 mm, width 35 mm, length: 2 m
1201756	NS 35/15 AL UNPERF 2000MM	DIN rail, deep-drawn, high profile, unperforated, 1.5 mm thick, material: Aluminum, height 15 mm, width 35 mm, length 2 m
1201895	NS 35/15 CU UNPERF 2000MM	DIN rail, material: Copper, unperforated, 1.5 mm thick, height 15 mm, width 35 mm, length: 2 m
1207679	NS 35/15 PERF 755MM	NS 35 DIN rail, perforated, height 15 mm, length 755 mm
1207682	NS 35/15 PERF 955MM	NS 35 DIN rail, perforated, height 15 mm, length 955 mm
1207695	NS 35/15 PERF 1155MM	NS 35 DIN rail, perforated, height 15 mm, length 1155 mm
1201730	NS 35/15 PERF 2000MM	DIN rail, material: Steel, perforated, height 15 mm, width 35 mm, length: 2 m
1201714	NS 35/15 UNPERF 2000MM	DIN rail, material: Steel, unperforated, height 15 mm, width 35 mm, length: 2 m
1201798	NS 35/15-2,3 UNPERF 2000MM	DIN rail, material: Steel, unperforated, 2.3 mm thick, height 15 mm, width 35 mm, length: 2 m
Bridges		
3030336	FBS 2-6	Plug-in bridge for cross-connections in the terminal center, 2-pos., color: Red
3030242	FBS 3-6	Plug-in bridge for cross-connections in the terminal center, 3-pos., color: Red
3030255	FBS 4-6	Plug-in bridge for cross-connections in the terminal center, 4-pos., color: Red

3030349	FBS 5-6	Plug-in bridge for cross-connections in the terminal center, 5-pos., color: Red
3030271	FBS 10-6	Plug-in bridge for cross-connections in the terminal center, 10-pos., color: Red
3030365	FBS 20-6	Plug-in bridge for cross-connections in the terminal center, 20-pos., color: Red
3032224	FBS 50-6	Plug-in bridge for cross-connections in the terminal center, 50-pos., color: Red

General

3022276	CLIPFIX 35-5	Snap-on end bracket, for NS 35/7.5 or NS 35/15 DIN rail, can be fitted with Zack strip ZB 5 and ZBF 5, terminal strip marker KLM 2 and KLM, parking facility for FBS...5, FBS...6, KSS 5, KSS 6, width: 5,15 mm, color: gray

Marking

0811228	X-PEN 0,35	Marker pen without ink cartridge, for manual labeling of markers, labeling extremely wipe-proof, line thickness 0.35 mm
1051016	ZB 6,LGS:FORTL.ZAHLEN	Zack strip, 10-section, printed horizontally: with the numbers, 1-10, 11-20 etc. up to 991-1000, color: white
5060935	ZB 6/WH-100:UNBEDRUCKT	Zack strip, unprinted: For individual labeling with M-PEN, ZB-T or CMS system, large batch, sufficient for labeling 1000 terminal blocks, for a terminal width of 6.2 mm, color: White
1050499	ZB 6:SO/CMS	Zack strip, 10-section, divisible, special printing, marking according to customer requirements

Plug/Adapter

0201689	MPS-IH BU	Insulating sleeve (blue), for MPS metal part to be ordered separately (0201744)
0201676	MPS-IH RD	Insulating sleeve (red), for MPS metal part to be ordered separately (0201744)
0201663	MPS-IH WH	Insulating sleeve (white), for MPS metal part to be ordered separately (0201744)
0201744	MPS-MT	Test plug, consisting of: Metal part for 2.3 mm diameter socket hole
3030925	PAI-4	Test adapter, for 4 mm diameter test plug PS and safety test plug, makes contact in the bridge shaft
3030996	PS-6	Modular test plug, for individual assembly of test plug strips, for UT, ST, DT and QT terminal blocks, can be labeled with ZBF 6, color: Red

Tools

1205053	SZS 0,6X3,5	Screwdriver, bladed, matches all screw terminal blocks up to 4.0 mm² connection cross section, blade: 0.6 x 3.5 mm, without VDE approval

Address

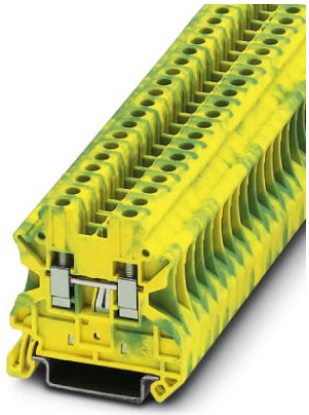
PHOENIX CONTACT Inc., USA
586 Fulling Mill Road
Middletown, PA 17057,USA
Phone (800) 888-7388
Fax (717) 944-1625
http://www.phoenixcon.com

Item # 16

Extract from the online catalog

UT 4-PE

Order No.: 3044128



http://eshop.phoenixcontact.de/phoenix/treeViewClick.do?UID=3044128

Universal terminal block with screw connection, cross section: 0.14 - 4 mm², AWG: 26 - 10, width: 6.2 mm, color: Green-yellow

Product notes

WEEE/RoHS-compliant since: 01/01/2003

http://www.download.phoenixcontact.com
Please note that the data given here has been taken from the online catalog. For comprehensive information and data, please refer to the user documentation. The General Terms and Conditions of Use apply to Internet downloads.

Commercial data	
EAN	4017918960407
Pack	50 Pcs.
Customs tariff	85369010
Weight/Piece	0.01325 KG
Catalog page information	Page 33 (CL-2007)

Technical data

General

Number of levels	1
Number of connections	2
Color	green-yellow

Insulating material	PA
Inflammability class acc. to UL 94	V0

Dimensions

Width	6.2 mm
Length	47.7 mm
Height NS 35/7,5	47.5 mm
Height NS 35/15	55 mm

Technical data

Rated surge voltage	8 kV
Pollution degree	3
Surge voltage category	III
Insulating material group	I
Connection in acc. with standard	IEC 60947-7-2
Open side panel	ja

Connection data

Conductor cross section solid min.	0.14 mm^2
Conductor cross section solid max.	6 mm^2
Conductor cross section stranded min.	0.14 mm^2
Conductor cross section stranded max.	6 mm^2
Conductor cross section AWG/kcmil min.	26
Conductor cross section AWG/kcmil max	10
Conductor cross section stranded, with ferrule without plastic sleeve min.	0.25 mm^2
Conductor cross section stranded, with ferrule without plastic sleeve max.	4 mm^2
Conductor cross section stranded, with ferrule with plastic sleeve min.	0.25 mm^2
Conductor cross section stranded, with ferrule with plastic sleeve max.	4 mm^2
2 conductors with same cross section, solid min.	0.14 mm^2
2 conductors with same cross section, solid max.	1.5 mm^2
2 conductors with same cross section, stranded min.	0.14 mm^2
2 conductors with same cross section, stranded max.	1.5 mm^2

2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, min.	0.5 mm^2
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, max.	2.5 mm^2
2 conductors with same cross section, stranded, ferrules without plastic sleeve, min.	0.25 mm^2
2 conductors with same cross section, stranded, ferrules without plastic sleeve, max.	1.5 mm^2
Type of connection	Screw connection
Stripping length	9 mm
Internal cylindrical gage	A4
Screw thread	M 3
Tightening torque, min	0.6 Nm
Tightening torque max	0.8 Nm

Certificates / Approvals

CSA

AWG/kcmil	26-10

CUL

AWG/kcmil	26-10

UL

AWG/kcmil	26-10
Certification	CB, CSA, CUL, DNV, GL, LR, UL, VDE-PZI

requested approbations

Certification Ex:	IECEx, KEMA-EX

Accessories

Item	Designation	Description
Assembly		
3047167	ATP-UT	Partition plate, for visual and electrical separation of terminal groups, width: 2 mm, color: gray

3047028	D-UT 2,5/10	Cover, for terminal block UT and UT...-PE, width 2.2 mm, color: Gray
0801762	NS 35/ 7,5 CU UNPERF 2000MM	DIN rail, material: Copper, unperforated, height 7.5 mm, width 35 mm, length: 2 m
1207640	NS 35/ 7,5 PERF 755MM	NS 35 DIN rail, height 7.5 mm, length 755 mm
1207653	NS 35/ 7,5 PERF 955MM	NS35 DIN rail, height 7.5 mm, length 955 mm
1207666	NS 35/ 7,5 PERF 1155MM	NS 35 DIN rail, height 7.5 mm, length 1155 mm
0801733	NS 35/ 7,5 PERF 2000MM	DIN rail, material: Steel, perforated, height 7.5 mm, width 35 mm, length: 2 m
0801681	NS 35/ 7,5 UNPERF 2000MM	DIN rail, material: Steel, unperforated, height 7.5 mm, width 35 mm, length: 2 m
1201756	NS 35/15 AL UNPERF 2000MM	DIN rail, deep-drawn, high profile, unperforated, 1.5 mm thick, material: Aluminum, height 15 mm, width 35 mm, length 2 m
1201895	NS 35/15 CU UNPERF 2000MM	DIN rail, material: Copper, unperforated, 1.5 mm thick, height 15 mm, width 35 mm, length: 2 m
1207679	NS 35/15 PERF 755MM	NS 35 DIN rail, perforated, height 15 mm, length 755 mm
1207682	NS 35/15 PERF 955MM	NS 35 DIN rail, perforated, height 15 mm, length 955 mm
1207695	NS 35/15 PERF 1155MM	NS 35 DIN rail, perforated, height 15 mm, length 1155 mm
1201730	NS 35/15 PERF 2000MM	DIN rail, material: Steel, perforated, height 15 mm, width 35 mm, length: 2 m
1201714	NS 35/15 UNPERF 2000MM	DIN rail, material: Steel, unperforated, height 15 mm, width 35 mm, length: 2 m
1201798	NS 35/15-2,3 UNPERF 2000MM	DIN rail, material: Steel, unperforated, 2.3 mm thick, height 15 mm, width 35 mm, length: 2 m

Bridges

3030336	FBS 2-6	Plug-in bridge for cross-connections in the terminal center, 2-pos., color: Red
3030242	FBS 3-6	Plug-in bridge for cross-connections in the terminal center, 3-pos., color: Red
3030255	FBS 4-6	Plug-in bridge for cross-connections in the terminal center, 4-pos., color: Red
3030349	FBS 5-6	Plug-in bridge for cross-connections in the terminal center, 5-pos., color: Red
3030271	FBS 10-6	Plug-in bridge for cross-connections in the terminal center, 10-pos., color: Red
3030365	FBS 20-6	Plug-in bridge for cross-connections in the terminal center, 20-pos., color: Red
3032224	FBS 50-6	Plug-in bridge for cross-connections in the terminal center, 50-pos., color: Red

General

3022276	CLIPFIX 35-5	Snap-on end bracket, for NS 35/7.5 or NS 35/15 DIN rail, can be fitted with Zack strip ZB 5 and ZBF 5, terminal strip marker KLM 2 and KLM, parking facility for FBS...5, FBS...6, KSS 5, KSS 6, width: 5,15 mm, color: gray

Marking

0811228	X-PEN 0,35	Marker pen without ink cartridge, for manual labeling of markers, labeling extremely wipe-proof, line thickness 0.35 mm
1051016	ZB 6,LGS:FORTL.ZAHLEN	Zack strip, 10-section, printed horizontally: with the numbers, 1-10, 11-20 etc. up to 991-1000, color: white
5060935	ZB 6/WH-100:UNBEDRUCKT	Zack strip, unprinted: For individual labeling with M-PEN, ZB-T or CMS system, large batch, sufficient for labeling 1000 terminal blocks, for a terminal width of 6.2 mm, color: White
1050499	ZB 6:SO/CMS	Zack strip, 10-section, divisible, special printing, marking according to customer requirements

Plug/Adapter

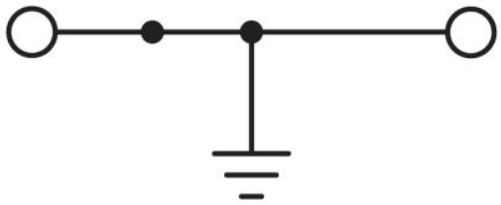
0201689	MPS-IH BU	Insulating sleeve (blue), for MPS metal part to be ordered separately (0201744)
0201676	MPS-IH RD	Insulating sleeve (red), for MPS metal part to be ordered separately (0201744)
0201663	MPS-IH WH	Insulating sleeve (white), for MPS metal part to be ordered separately (0201744)
0201744	MPS-MT	Test plug, consisting of: Metal part for 2.3 mm diameter socket hole
3030925	PAI-4	Test adapter, for 4 mm diameter test plug PS and safety test plug, makes contact in the bridge shaft
3030996	PS-6	Modular test plug, for individual assembly of test plug strips, for UT, ST, DT and QT terminal blocks, can be labeled with ZBF 6, color: Red

Tools

1205053	SZS 0,6X3,5	Screwdriver, bladed, matches all screw terminal blocks up to 4.0 mm² connection cross section, blade: 0.6 x 3.5 mm, without VDE approval

Drawings

Circuit diagram



Address

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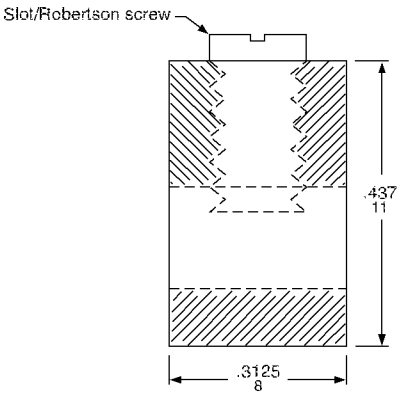
http://www.phoenixcon.com



Cross Section of Size 1 Ground Bar

TECHNICAL INFORMATION

Grounding Bar Kits

All PK equipment grounding kits are supplied with mounting screws, necessary installation instructions, and an “Equipment Grounding Terminal” self-adhesive label.

Catalog Number	Total Qty.	Terminals: Quantity Each Size See “Wire Range Table” below.						Approximate Overall Length		Distance Between Mounting Holes		Mounting
		I	II	III	IV	V	VI	in.	mm	in.	mm	
PK0GTA2 ◆	2						2	1.75	44	One hole	One hole	Top
PK0GTA6 ■	6					6		4.61	117	1.69	43	Top
PK3GTA1 ✚	3	3						1.38	35	One hole	One hole	Top
PK4GTA ✚	4	4						1.63	41	One hole	One hole	Top
PK5GTA ▼	5	5						2.25	57	1.25	32	Top
PK7GTA ✚	7	7						2.88	73	1.25	32	Top or side
PK9GTA1 ✚	9	9						3.25	83	One hole	One hole	Top
PK9GTA ✚	9	9						3.78	96	3.13	80	Top
PK12GTA ✚	12	12						4.70	119	3.13	80	Top
PK15GTA ✚	15	15						5.63	143	3.13	80	Top
PK15GTAL ★	16	15	1					8.13	207	3.13	80	Top
PK15GTA6 ❖	21	15			6			5.88	149	▲	▲	Top
PK18GTA ✚	18	18						6.56	167	3.13	80	Top
PK18GTAL ★	19	18	1					8.81	224	3.13	80	Top
PK23GTA ✚	23	23						8.11	206	3.13	80	Top
PK23GTAL ★	24	23	1					9.44	240	3.13	80	Top
PK27GTA ● ✚	27 or 26	27 26		1				9.36	238	3.13	80	Top

● PK27GTA includes one main grounding lug that mounts with two terminal screws and requires three terminals for mounting.
▲ 3.13 in. (80 mm) on small terminals; 5.25 in. (133 mm) on large terminals.
◆ Mounting screw 40205-065-01 (one required).
✚ Mounting screw 21594-14220 (two required).
★ Mounting screw 21594-14302 (two required).
■ Mounting screw 21922-18360 (two required).
▼ Mounting screw 21594-14241 (two required).
❖ Mounting screws 21594-14241(two required) and 21594-17121(two required).

Wire Range Table

Size	Cu (AWG)	Al (AWG)
I	(1) #14–#4 or (2) #14 or #12	(1) #12–#4 or (2) #12 or #10
II	(1) #1–4/0	(1) #1–4/0
III	(1) #6–2/0	(1) #6–2/0
IV	(1) #6–3/0	(1) #6–3/0
V	(1) #14–1/0	(1) #14–1/0
VI	(1) #10–2/0	(1) #6–2/0

How to Order Ty-Duct®

Ordering the Ty-Duct® products you need is as easy as 1, 2, 3!

After selecting the appropriate Ty-Duct solutions for your application, make sure you complete the following checklist.

For Ty-Duct Wiring Duct and Covers:

1. Specify color
2. Indicate if you want the duct without mounting holes
3. Indicate if you want an adhesive-backed duct (not available in Wide Slot Duct — Halogen Free)

[_] = space for color identifier:

G	= Gray
W	= White
B	= Black
I	= Intrinsic Blue

2 *To order duct without mounting holes, add suffix NM to catalog number. **Example:** TY75X1WPG6NM is a .75" x 1" wide slot gray duct with no mounting holes.*

3 *To order Adhesive-Backed Duct, add suffix A to Catalog Number.*

***Example:** TY75x15WPB6A is a .75" x 1.5" wide slot black duct with adhesive backing.*

Shelf life for adhesive is 1 year.

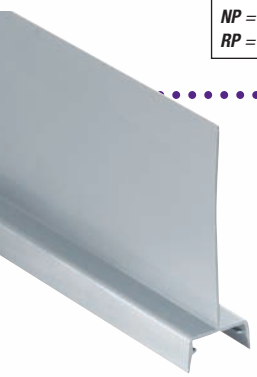
Nominal Width x Nominal Height | *Standard Carton Quantity*

CAT. NO.	DESCRIPTION	SIZE (W x H) IN.	SIZE (W x H) MM	COVER CAT. NO.	DUCT STD. CTN. QTY.	COVER STD. CTN. QTY.	LENGTH (FT.)
TY75X1WP[G]6NM	.75 x 1 Wide Slot Duct	0.94 x 1.09	23.9 x 27.7		120		
TY75X15WP[B]6A	.75 x 1.5 Wide Slot Duct	0.94 x 1.56	23.9 x 39.6	TY75CP[_]6	120	120	6
TY75X2WP[I]6	.75 x 2 Wide Slot Duct	0.94 x 2.07	23.9 x 52.6		120		

***SP** = Solid*
***WP** = Wide Slot*
***NP** = Narrow Slot*
***RP** = Round Hole*

1 *Catalog Number must be completed by adding suffix **G** for Gray, **W** for White, **I** for Intrinsic Blue, **B** for Black. **Example:** TY75x2WPI6 is a .75" x 2" wide slot intrinsic blue duct. Cover color must be specified also.*

Standard lengths are 6 feet.



For Ty-Duct Dividers:

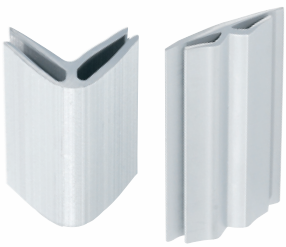
*Catalog Number must be completed by adding suffix SP for Solid or WP for Wide Slot. **Example:** TY2DSPG6 is a 2" high solid wall gray divider.*

CAT. NO.	DESCRIPTION	LENGTH (FT.)	STD. CTN. QTY
TY2D[SP][G]6	2" High Wall Divider	6	120

*Catalog Number must be completed by adding suffix G for Gray, W for White, I for Intrinsic Blue, B for Black. **Example:** TY2DSPG6 is a 2" high solid wall gray divider.*

For Ty-Duct Corner & Joining Strips:

Corner Strip sample shown below. Joining Strips are ordered the same way.



CAT. NO.	DESCRIPTION	LENGTH (FT.)	STD. CTN. QTY
TYCS[G]6	Corner Strip	6	120
TYJS[G]6	Joining Strip	6	120

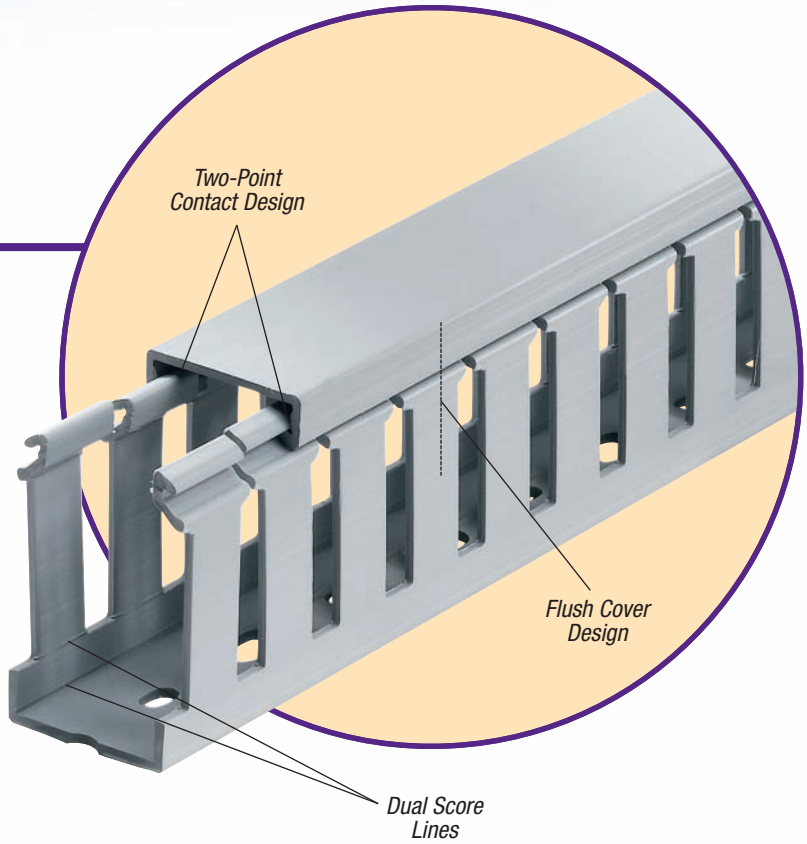
*Catalog Number must be completed by adding suffix G for Gray, W for White, I for Intrinsic Blue, B for Black. **Example:** TYCSG6 is a gray corner strip.*

Wide Slot Wiring Duct

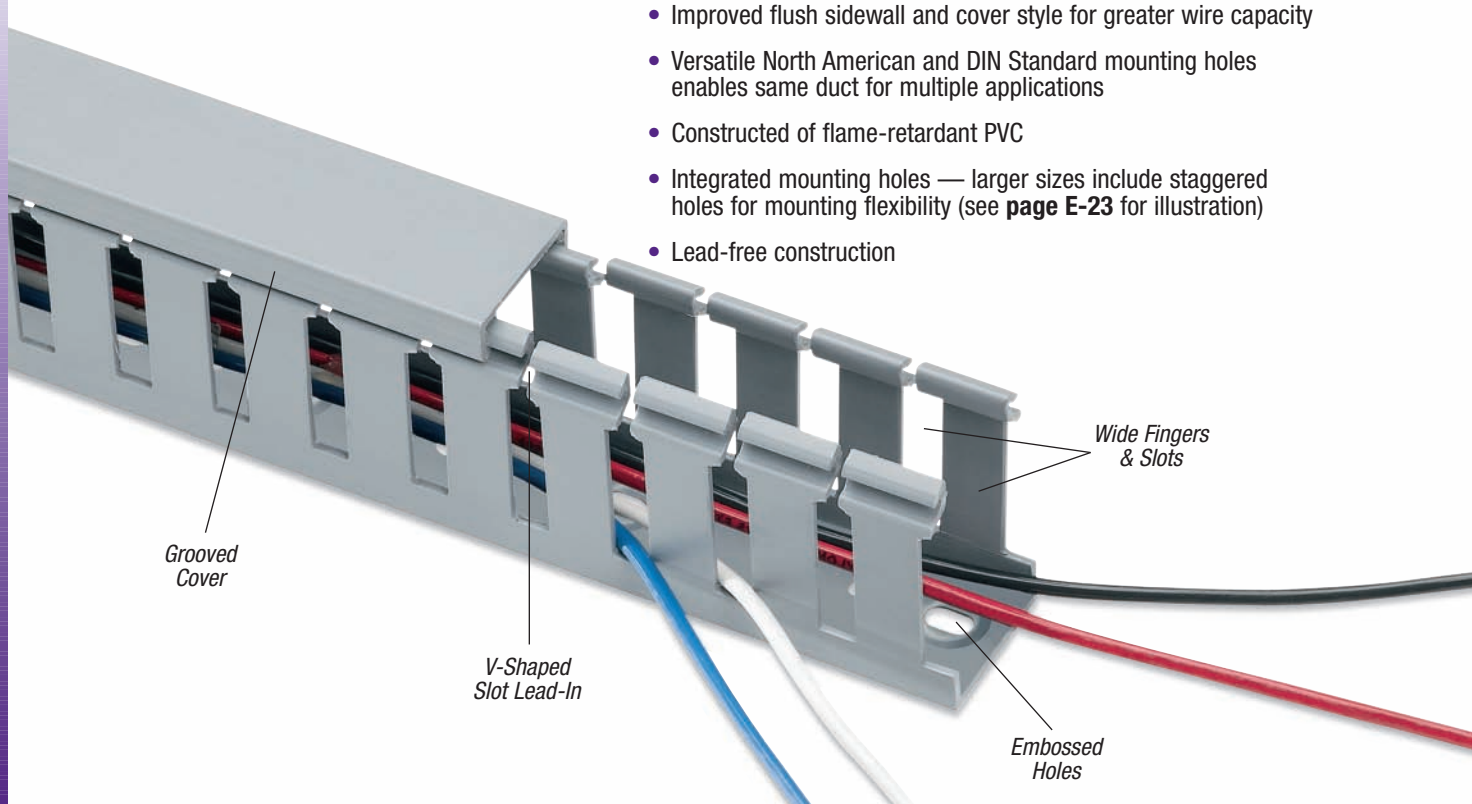
Greater sidewall rigidity with increased versatility!

Wide Slot Wiring Duct — PVC

- Wide fingers and slots increase rigidity and enable insertion of bundles
- Non-slip cover does not slide easily and resists vibration
- Rounded edges keep hands and wires free of abrasion
- V-shaped slot lead-in enables easier and faster wire installation
- Dual score lines are designed to yield clean breakoffs at the base of the slot and the duct
- Restricted slot design makes sure that wires are held with or without the cover inserted
- Flush cover attaches flush with sidewall for finished look



- Improved flush sidewall and cover style for greater wire capacity
- Versatile North American and DIN Standard mounting holes enables same duct for multiple applications
- Constructed of flame-retardant PVC
- Integrated mounting holes — larger sizes include staggered holes for mounting flexibility (see **page E-23** for illustration)
- Lead-free construction



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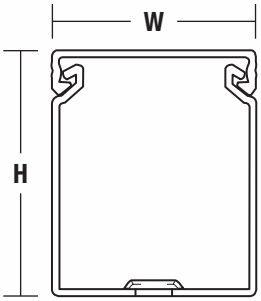
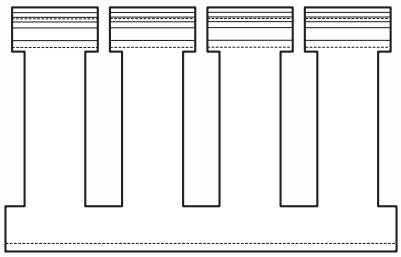
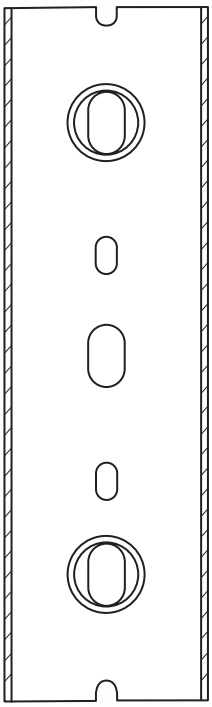
Wide Slot Wiring Duct



Front View w/Cover


Side View

For a complete listing of Wide Slot dimensional details see **page E-23.**


Bottom View

CAT. NO.	DESCRIPTION	SIZE (W x H) IN.	SIZE (W x H) MM	COVER CAT. NO.	DUCT STD. CTN. QTY	COVER STD. CTN. QTY	LENGTH (FT.)
TY75X1WP[_]6	.75 x 1 Wide Slot Duct	0.94 x 1.14	23.9 x 27.7		120		
TY75X15WP[_]6	.75 x 1.5 Wide Slot Duct	0.94 x 1.60	23.9 x 39.6	TY75CP[_]6	120	120	6
TY75X2WP[_]6	.75 x 2 Wide Slot Duct	0.94 x 2.10	23.9 x 52.6		120		
TY1X1WP[_]6	1 x 1 Wide Slot Duct	1.25 x 1.14	31.8 x 27.7		120		
TY1X15WP[_]6	1 x 1.5 Wide Slot Duct	1.25 x 1.60	31.8 x 39.9		120		
TY1X2WP[_]6	1 x 2 Wide Slot Duct	1.25 x 2.10	31.8 x 52.8	TY1CP[_]6	120	120	6
TY1X3WP[_]6	1 x 3 Wide Slot Duct	1.25 x 3.05	31.8 x 77.7		120		
TY1X4WP[_]6	1 x 4 Wide Slot Duct	1.25 x 4.37	31.8 x 111.3		60		
TY15X1WP[_]6	1.5 x 1 Wide Slot Duct	1.75 x 1.14	44.5 x 27.7		120		
TY15X15WP[_]6	1.5 x 1.5 Wide Slot Duct	1.75 x 1.60	44.5 x 39.9		120		
TY15X2WP[_]6	1.5 x 2 Wide SlotDuct	1.75 x 2.10	44.5 x 52.8	TY15CP[_]6	120	120	6
TY15X3WP[_]6	1.5 x 3 Wide Slot Duct	1.75 x 3.05	44.5 x 77.7		120		
TY15X4WP[_]6	1.5 x 4 Wide Slot Duct	1.75 x 4.37	44.5 x 111.3		60		
TY2X1WP[_]6	2 x 1 Wide Slot Duct	2.25 x 1.24	57.2 x 28.4		120		
TY2X15WP[_]6	2 x 1.5 Wide Slot Duct	2.25 x 1.70	57.2 x 40.4		120		
TY2X2WP[_]6	2 x 2 Wide Slot Duct	2.25 x 2.19	57.2 x 53.3	TY2CP[_]6	120	120	6
TY2X3WP[_]6	2 x 3 Wide Slot Duct	2.25 x 3.14	57.2 x 78.2		60		
TY2X4WP[_]6	2 x 4 Wide Slot Duct	2.25 x 4.46	57.2 x 111.8		60		
TY2X5WP[_]6	2 x 5 Wide Slot Duct	2.25 x 5.15	57.2 x 129.3		60		
TY25X2WP[_]6	2.5 x 2 Wide Slot Duct	2.75 x 2.19	69.9 x 53.6		120		
TY25X3WP[_]6	2.5 x 3 Wide Slot Duct	2.75 x 3.14	69.9 x 78.2	TY25CP[_]6	60	120	6
TY25X4WP[_]6	2.5 x 4 Wide Slot Duct	2.75 x 4.46	69.9 x 111.8		60		
TY3X1WP[_]6	3 x 1 Wide SlotDuct	3.25 x 1.24	82.6 x 29.0		120		
TY3X2WP[_]6	3 x 2 Wide Slot Duct	3.25 x 2.19	82.6 x 54.9		60		
TY3X3WP[_]6	3 x 3 Wide Slot Duct	3.25 x 3.14	82.6 x 79.8	TY3CP[_]6	60	120	6
TY3X4WP[_]6	3 x 4 Wide Slot Duct	3.25 x 4.46	82.6 x 113.5		60		
TY3X5WP[_]6	3 x 5 Wide Slot Duct	3.25 x 5.15	82.6 x 130.6		60		
TY4X15WP[_]6	4 x 1.5 Wide Slot Duct	4.25 x 1.70	108.0 x 42.4		60		
TY4X2WP[_]6	4 x 2 Wide Slot Duct	4.25 x 2.19	108.0 x 55.1		60		
TY4X3WP[_]6	4 x 3 Wide Slot Duct	4.25 x 3.14	108.0 x 80.0	TY4CP[_]6	60	120	6
TY4X4WP[_]6	4 x 4 Wide Slot Duct	4.25 x 4.46	108.0 x 113.8		30		
TY4X5WP[_]6	4 x 5 Wide Slot Duct	4.25 x 5.15	108.0 x 130.8		30		
TY6X4WP[_]6	6 x 4 Wide Slot Duct	6.25 x 4.46	158.8 x 114.0	TY6CP[_]6	30	60	6

[_] = space for color identifier:

- G = Gray
- W = White
- B = Black
- I = Intrinsic Blue

• Standard lengths are 6 feet.

+ Catalog Number must be completed by adding suffix G for Gray, W for White, I for Intrinsic Blue, B for Black.
Example: *TY75X1WPG6 is a .75" x 1" wide slot gray duct.*

To order duct without mounting holes, add suffix NM to catalog number.
Example: *TY75X1WPG6NM is a .75" x 1" wide slot gray duct with no mounting holes.*

To order Adhesive-Backed Duct, add suffix A to Catalog Number.
Example: *TY75X1WPG6A is a .75" x 1" wide slot gray duct with adhesive backing. Shelf life for adhesive is 1 year.*

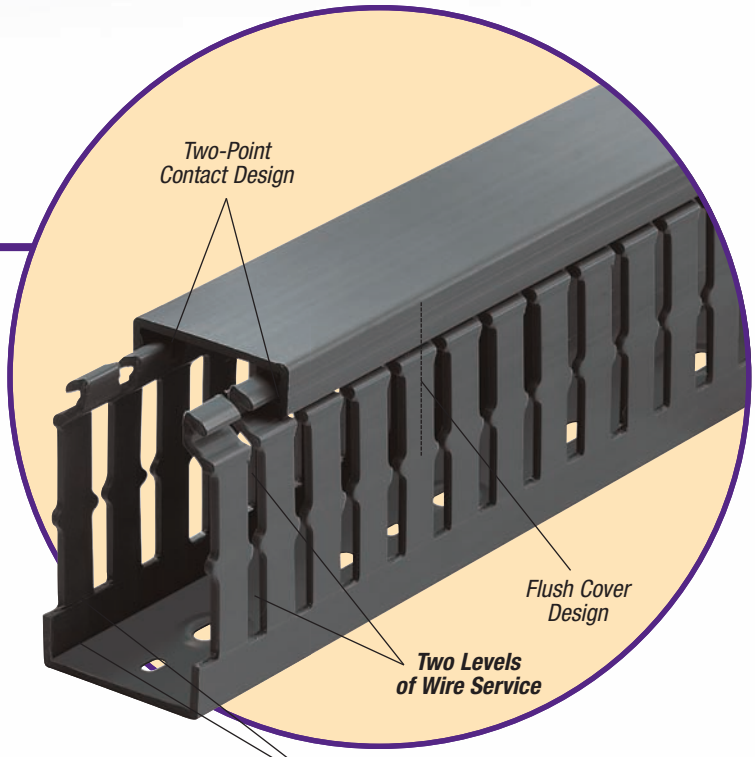
PVC vinyl duct is UL Recognized, CSA Certified and CE Compliant.

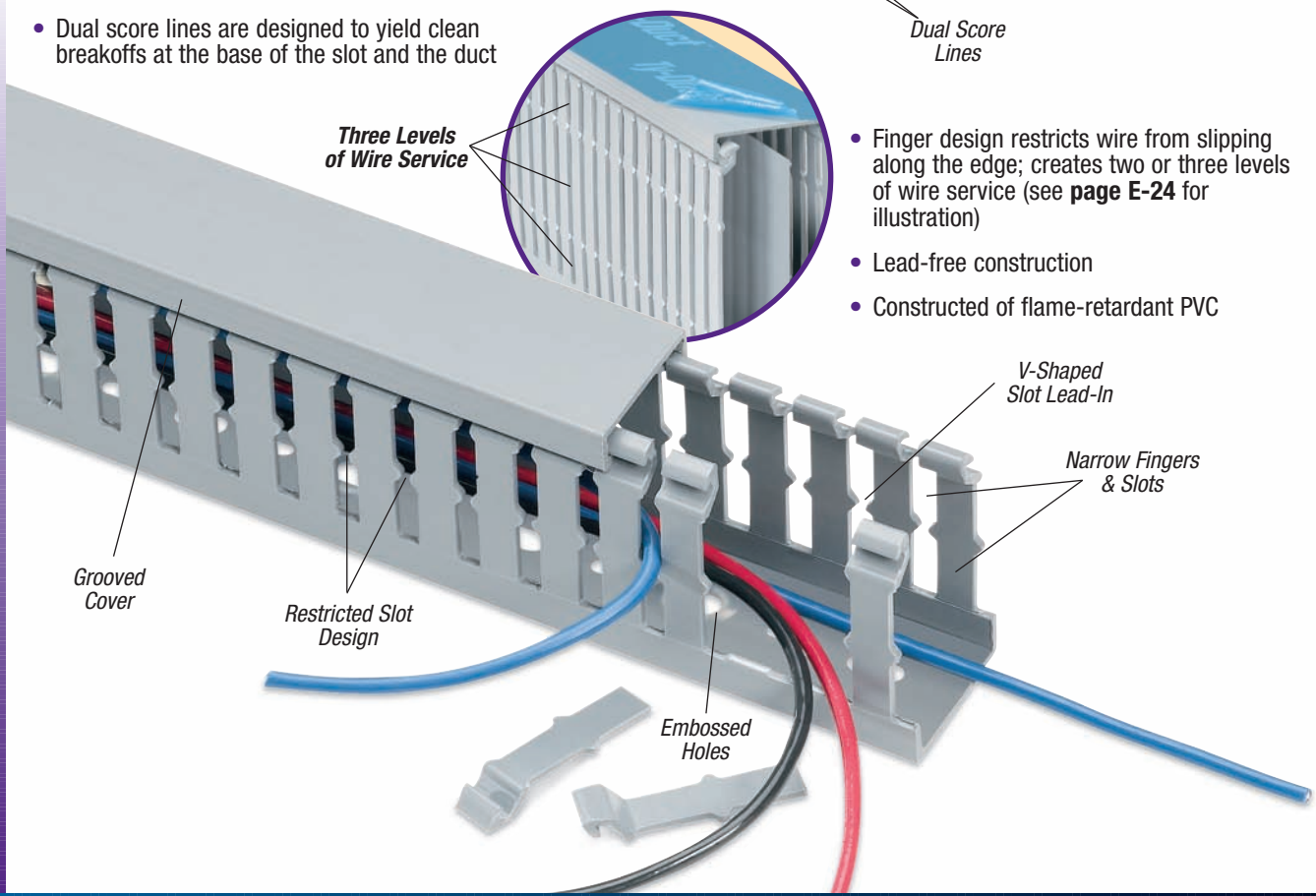
Narrow Slot Wiring Duct

Designed to fit the spacing of high-density terminal blocks!

Narrow Slot Wiring Duct

- Smaller, higher number of fingers for more concise harnessing
- Non-slip cover does not slide easily and resists vibration
- Rounded edges keep hands and wires free of abrasion
- V-shaped slot lead-in enables easier and faster wire installation
- Restricted slot design makes sure that wires are held with or without the cover inserted
- Flush cover attaches flush with sidewall for finished look
- Versatile North American and DIN Standard mounting holes enable same duct for multiple applications
- Dual score lines are designed to yield clean breakoffs at the base of the slot and the duct





- Finger design restricts wire from slipping along the edge; creates two or three levels of wire service (see **page E-24** for illustration)
- Lead-free construction
- Constructed of flame-retardant PVC

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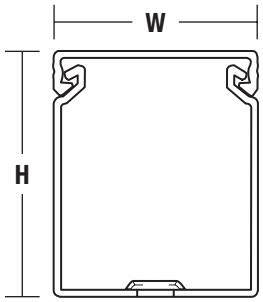
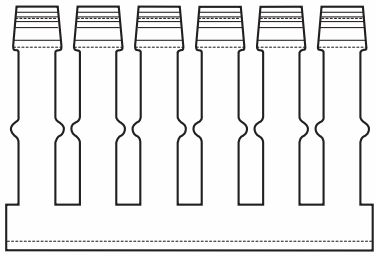
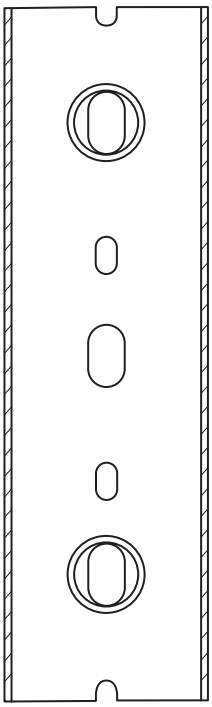
Narrow Slot Wiring Duct



Front View w/Cover


Side View

For a complete listing of Narrow Slot dimensional details see page E-24.


Bottom View

CAT. NO.	DESCRIPTION	SIZE (W x H) IN.	SIZE (W x H) MM	COVER CAT. NO.	DUCT STD. CTN. QTY	COVER STD. CTN. QTY	LENGTH (FT.)
TY75X15NP[_]6	.75 x 1.5 Narrow Slot Duct	0.94 x 1.60	23.9 x 39.6	TY75CP[_]6	120	120	6
TY1X1NP[_]6	1 x 1 Narrow Slot Duct	1.25 x 1.14	31.8 x 27.7		120		
TY1X15NP[_]6	1 x 1.5 Narrow Slot Duct	1.25 x 1.60	31.8 x 39.9		120		
TY1X2NP[_]6	1 x 2 Narrow Slot Duct	1.25 x 2.10	31.8 x 52.8	TY1CP[_]6	120	120	6
TY1X3NP[_]6	1 x 3 Narrow Slot Duct	1.25 x 3.05	31.8 x 77.7		120		
TY1X4NP[_]6	1 x 4 Narrow Slot Duct	1.25 x 4.37	31.8 x 111.3		60		
TY15X1NP[_]6	1.5 x 1 Narrow Slot Duct	1.75 x 1.14	44.5 x 27.7		120		
TY15X15NP[_]6	1.5 x 1.5 Narrow Slot Duct	1.75 x 1.60	44.5 x 39.9		120		
TY15X2NP[_]6	1.5 x 2 Narrow Slot Duct	1.75 x 2.10	44.5 x 52.8	TY15CP[_]6	120	120	6
TY15X3NP[_]6	1.5 x 3 Narrow Slot Duct	1.75 x 3.05	44.5 x 77.7		120		
TY15X4NP[_]6	1.5 x 4 Narrow Slot Duct	1.75 x 4.37	44.5 x 111.3		60		
TY2X1NP[_]6	2 x 1 Narrow Slot Duct	2.25 x 1.24	57.2 x 28.4		120		
TY2X15NP[_]6	2 x 1.5 Narrow Slot Duct	2.25 x 1.70	57.2 x 40.4		120		
TY2X2NP[_]6	2 x 2 Narrow Slot Duct	2.25 x 2.19	57.2 x 53.3	TY2CP[_]6	120	120	6
TY2X3NP[_]6	2 x 3 Narrow Slot Duct	2.25 x 3.14	57.2 x 78.2		60		
TY2X4NP[_]6	2 x 4 Narrow Slot Duct	2.25 x 4.46	57.2 x 111.8		60		
TY2X5NP[_]6	2 x 5 Narrow Slot Duct	2.25 x 5.15	57.2 x 129.3		60		
TY25X2NP[_]6	2.5 x 2 Narrow Slot Duct	2.75 x 2.19	69.9 x 53.6		120		
TY25X3NP[_]6	2.5 x 3 Narrow Slot Duct	2.75 x 3.14	69.9 x 78.2	TY25CP[_]6	60	120	6
TY25X4NP[_]6	2.5 x 4 Narrow Slot Duct	2.75 x 4.46	69.9 x 111.8		60		
TY3X1NP[_]6	3 x 1 Narrow Slot Duct	3.25 x 1.24	82.6 x 29.0		120		
TY3X2NP[_]6	3 x 2 Narrow Slot Duct	3.25 x 2.19	82.6 x 54.9		60		
TY3X3NP[_]6	3 x 3 Narrow Slot Duct	3.25 x 3.14	82.6 x 79.8	TY3CP[_]6	60	120	6
TY3X4NP[_]6	3 x 4 Narrow Slot Duct	3.25 x 4.46	82.6 x 113.5		60		
TY3X5NP[_]6	3 x 5 Narrow Slot Duct	3.25 x 5.15	82.6 x 130.6		60		
TY4X2NP[_]6	4 x 2 Narrow Slot Duct	4.25 x 2.19	108.0 x 55.1		60		
TY4X3NP[_]6	4 x 3 Narrow Slot Duct	4.25 x 3.14	108.0 x 80.0	TY4CP[_]6	60	120	6
TY4X4NP[_]6	4 x 4 Narrow Slot Duct	4.25 x 4.46	108.0 x 113.8		30		
TY4X5NP[_]6	4 x 5 Narrow Slot Duct	4.25 x 5.15	108.0 x 130.8		30		

[_] = space for color identifier:

- G = Gray
- W = White
- B = Black
- I = Intrinsic Blue

- *Standard lengths are 6 feet.*

+ Catalog Number must be completed by adding suffix G for Gray, W for White, I for Intrinsic Blue, B for Black.
Example: *TY75X15NPB6 is a .75" x 1.5" narrow slot black duct.*

To order duct without mounting holes, add suffix NM to catalog number.
Example: *TY75X15NPB6NM is a .75" x 1.5" narrow slot black duct with no mounting holes.*

To order Adhesive-Backed Duct, add suffix A to Catalog Number.
Example: *TY75X15NPB6A is a .75" x 1.5" narrow slot black duct with adhesive backing. Shelf life for adhesive is 1 year.*

PVC vinyl duct is UL Recognized, CSA Certified and CE Compliant.

Technical Information

Ty-Duct® meets all of the prominent agency approvals and standards.

Agency Approvals:

Thomas & Betts Ty-Duct wiring duct is UL recognized for all requirements set forth in UL standard 1565 “Positioning Device.”

The Ty-Duct wiring duct meets all applicable requirements of the Canadian Standard Association as described in CSA C22.2 No. 18.5.

All Ty-Duct wiring duct components comply with the European Directives for CE (Conformite European) Marking.

All materials used in the making of the Ty-Duct wiring duct comply with the European Directives 2002/95/EC (RoHS), 2002/96/EC (WEEE), and 2003/11/EC.

Standards:

NFPA-79-2002

Thomas & Betts Ty-Duct wiring duct is compliant with the National Fire Protection Agency NFPA-79-2002. All materials used in the manufacturing of the Ty-Duct components are selected from flame-retardant material and comply with IEC 60332-1. The testing is required in order to comply with NFPA-79-2002, Section 13.3.1.

UL 508/UL 508A

As required in UL508/UL508A a factory-installed conductor shall be separated from a conductor used in a different circuit when the conductors are not insulated for the maximum voltage of either circuit. The Ty-Duct wiring duct with a divider wall creates the required separation to meet this requirement.

DIN 43 659

This European standard specifies dimensions for slotted trunkings installed in electrical switchgear assemblies.
The standard defines the following dimensions:

- The mounting hole pattern
- The mounting hole slot dimensions
- The mounting hole pitch and location
- The minimum overall product length

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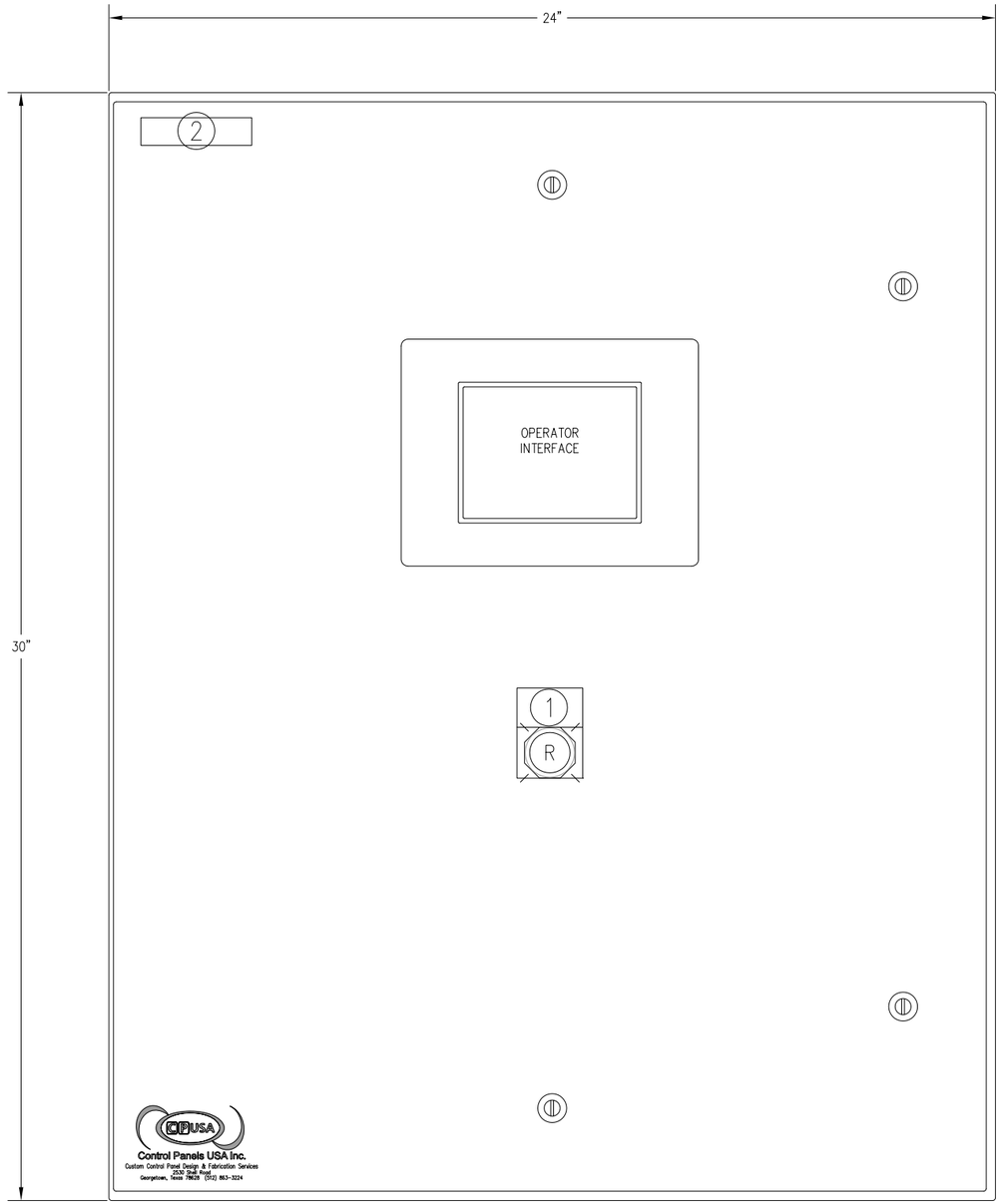
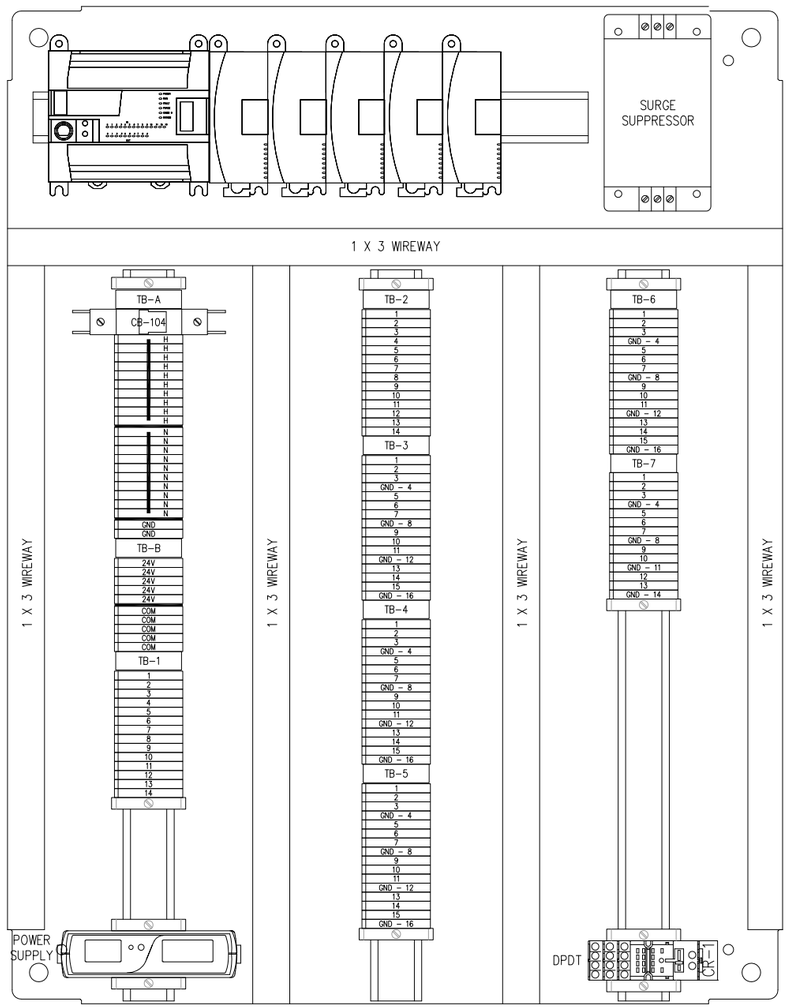


EXTERIOR DOOR



INTERIOR LAYOUT

DOOR TAG LAYOUT	
TAG #	TAG DESCRIPTION: LINE 1 / LINE 2 / LINE 3 / LINE 4
1	ALARM INDICATION / VIEW HMI FOR ALARMS
2	HSI3100 BLOWER CONTROL PANEL

REV	DATE	APP	DESCRIPTION
A	7/31/12		FOR SUBMITTAL REVIEW

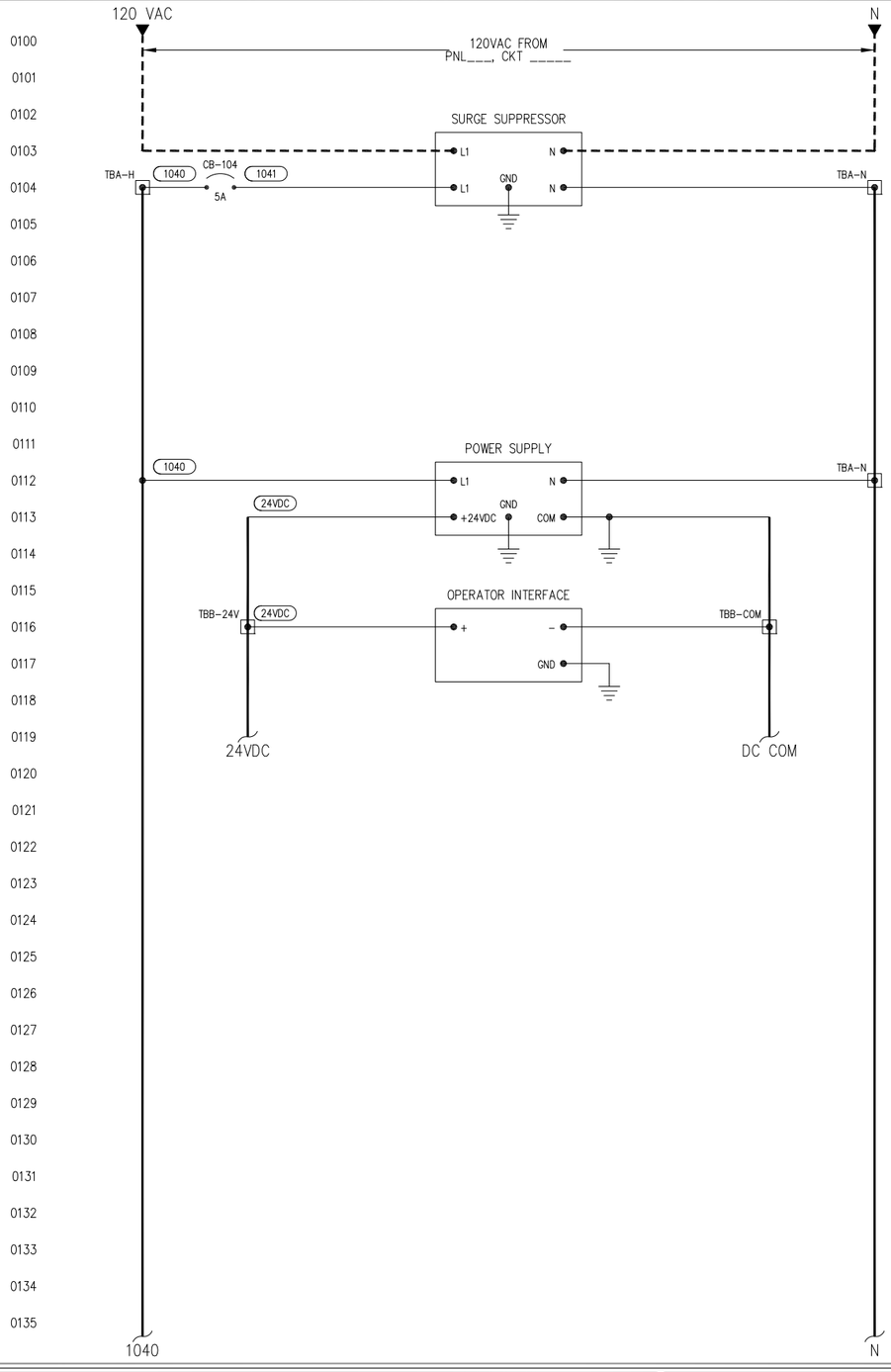
DESIGNER: J. SAUCEDA
DRAWN BY: JLM
DATE: 7/31/12
CHECKED BY:
DRAWING STATUS: FOR REVIEW

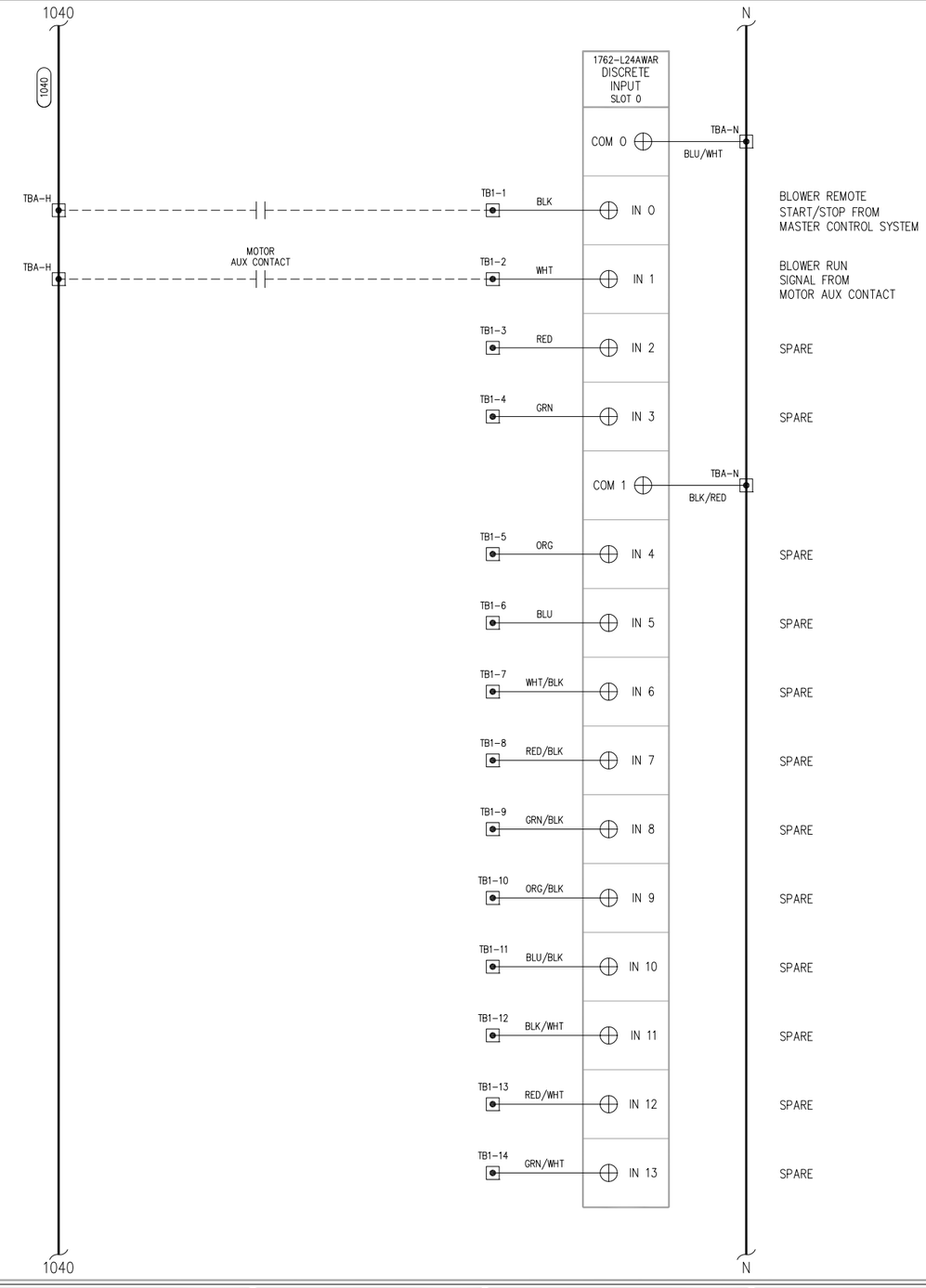
CLIENT: *HOUSTON SERVICE INDUSTRIES*

HSI3100-0-ABCD-0-0
BLOWER CONTROL PANEL
QTY 4
PANEL LAYOUT

JOB NO. 12-6133
DWG. NO. CP-1.0
SCALE 6"=1'-0"
SHEET
REV. A

CAD FILE:
TIME:
EDIT DATE:





SCHEMATIC LEGEND

- INTERNAL PANEL WIRING
- FIELD WIRING
- TERMINAL LOCATED IN LOCAL PANEL
- WIRE LABEL

REV	DATE	APP	DESCRIPTION
A	7/31/12		FOR SUBMITTAL REVIEW

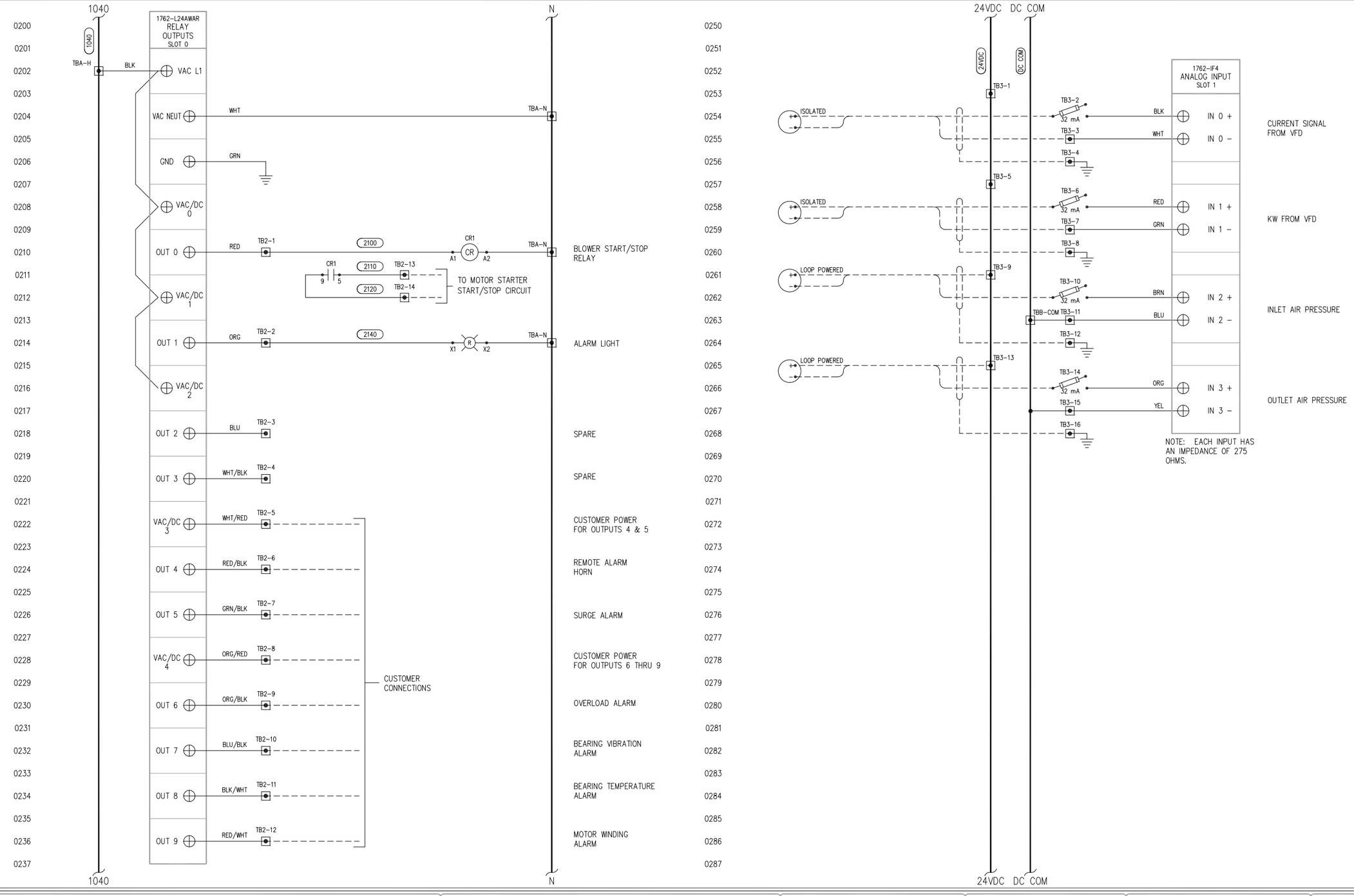
DESIGNER: J. SAUCEDA
DRAWN BY: JLM
DATE: 7/31/12
CHECKED BY:
DRAWING STATUS: FOR REVIEW

CLIENT: *HOUSTON SERVICE INDUSTRIES*

HSI3100-0-ABCD-0-0
LOCAL BLOWER CONTROL PANEL QTY 4
ELECTRICAL SCHEMATIC

JOB NO. 12-6133
DWG. NO. E-1.1
SCALE N.T.S.
SHEET
REV. A

CAD FILE:
TIME:
EDIT DATE:



SCHEMATIC LEGEND

- INTERNAL PANEL WIRING
- FIELD WIRING
- TERMINAL LOCATED IN LOCAL PANEL
- WIRE LABEL

REV	DATE	APP	DESCRIPTION
A	7/31/12		FOR SUBMITTAL REVIEW

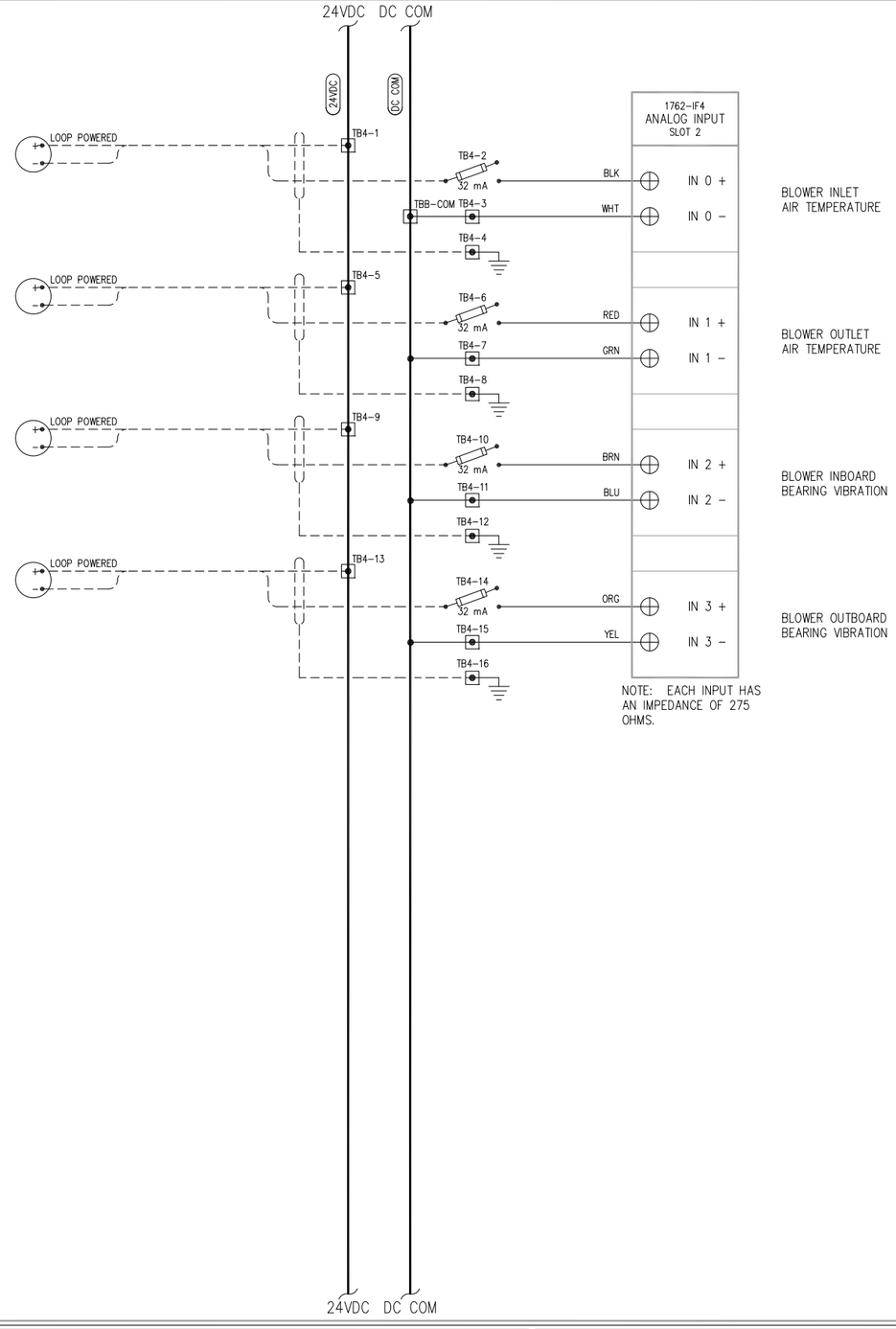
DESIGNER: J. SAUCEDA
DRAWN BY: JLM
DATE: 7/31/12
CHECKED BY:
DRAWING STATUS: FOR REVIEW

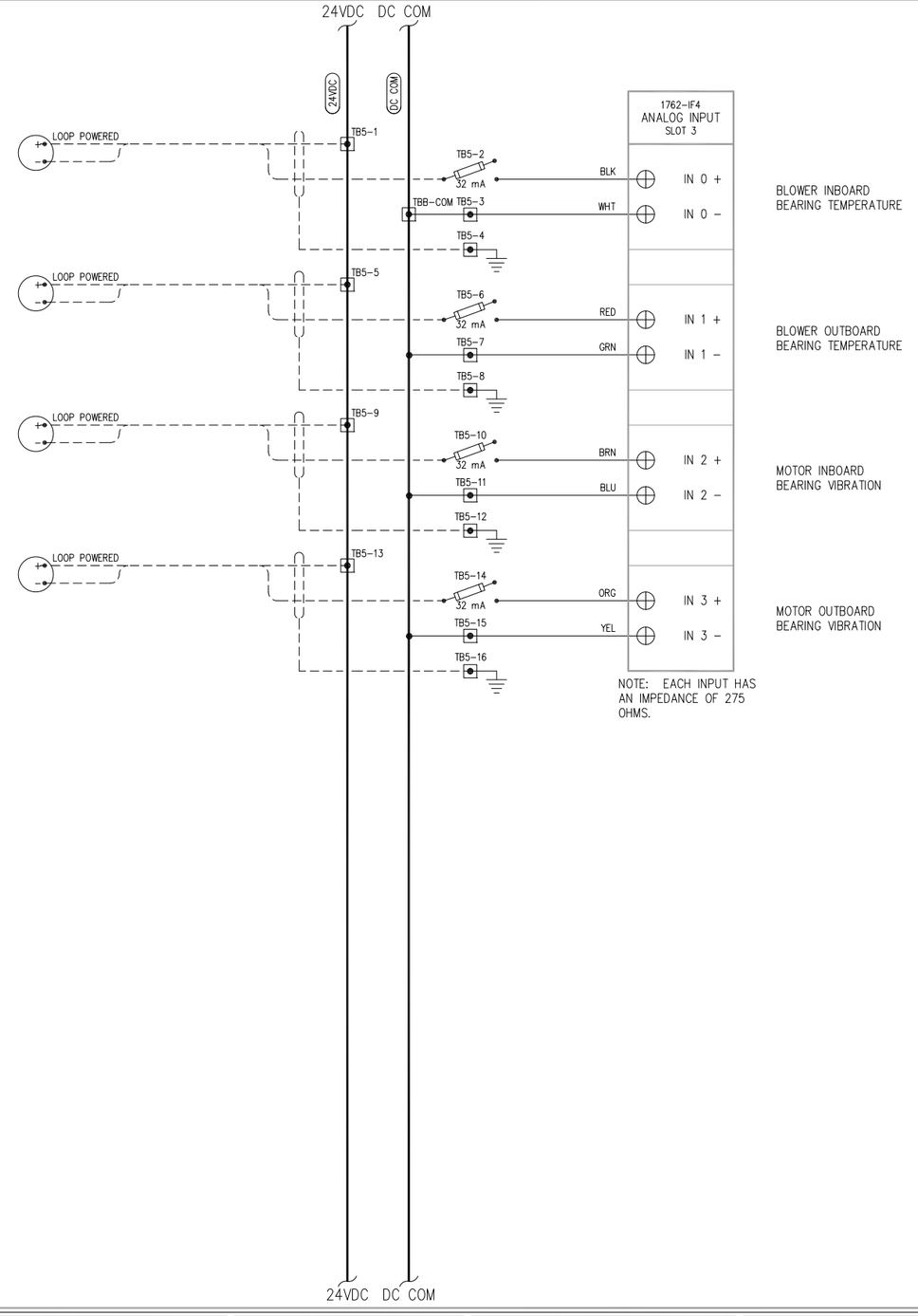
CLIENT: *HOUSTON SERVICE INDUSTRIES*

HSI3100-0-ABCD-0-0
LOCAL BLOWER CONTROL PANEL
QTY 4
ELECTRICAL SCHEMATIC

JOB NO. 12-6133
DWG. NO. E-1.2
SCALE N.T.S.
SHEET
REV. A

CAD FILE:
TIME:
DRT DATE:





SCHEMATIC LEGEND

- INTERNAL PANEL WIRING
- FIELD WIRING
- TERMINAL LOCATED IN LOCAL PANEL
- #### WIRE LABEL

REV	DATE	APP	DESCRIPTION
A	7/31/12		FOR SUBMITTAL REVIEW

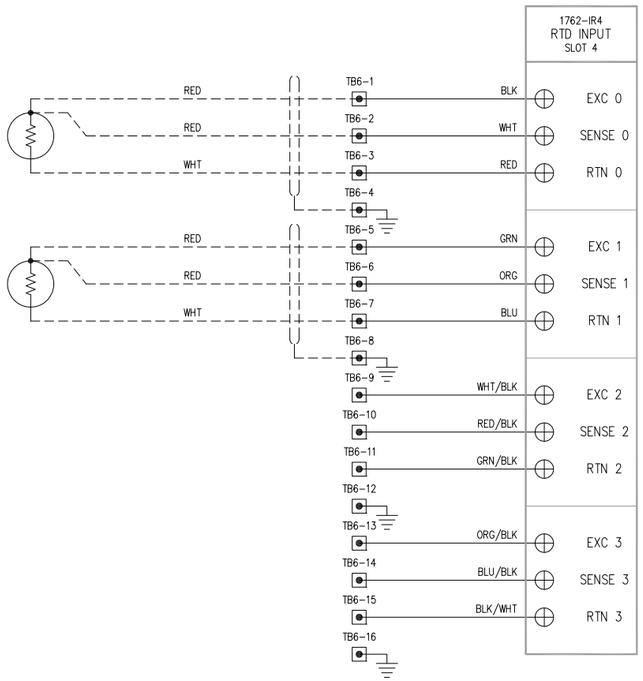
DESIGNER: J. SAUCEDA
DRAWN BY: JLM
DATE: 7/31/12
CHECKED BY:
DRAWING STATUS: FOR REVIEW

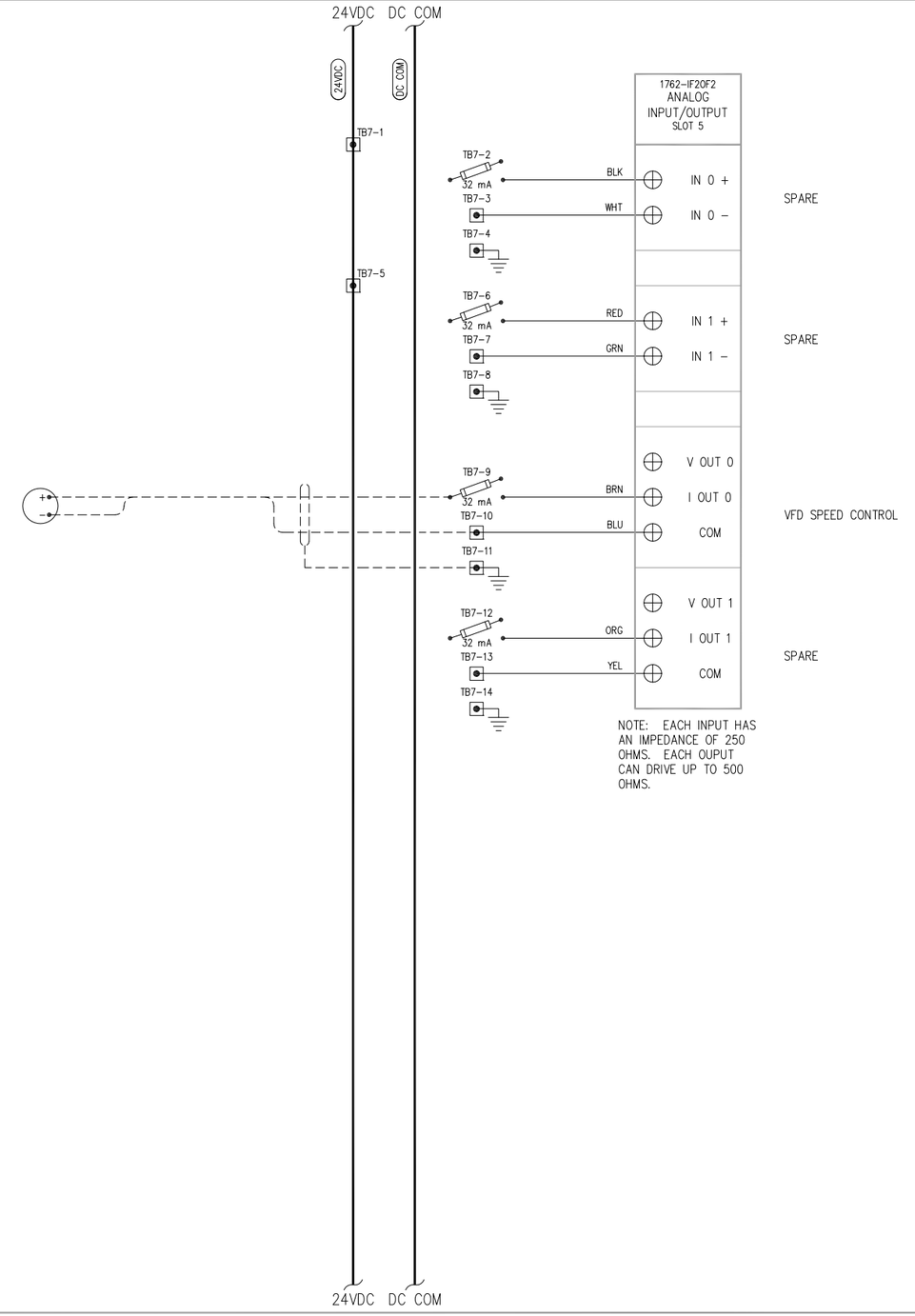
CLIENT: *HOUSTON SERVICE INDUSTRIES*

HSI3100-0-ABCD-0-0
LOCAL BLOWER CONTROL PANEL
QTY 4
ELECTRICAL SCHEMATIC

JOB NO. 12-6133
DWG. NO. E-1.3
SCALE N.T.S.
SHEET
REV. A

CAD FILE:
TIME:
DRT DATE:





SCHEMATIC LEGEND

- INTERNAL PANEL WIRING
- FIELD WIRING
- TERMINAL LOCATED IN LOCAL PANEL
- #### WIRE LABEL

REV	DATE	APP	DESCRIPTION
A	7/31/12		FOR SUBMITTAL REVIEW

DESIGNER: J. SAUCEDA
DRAWN BY: JLM
DATE: 7/31/12
CHECKED BY:
DRAWING STATUS: FOR REVIEW

CLIENT: *HOUSTON SERVICE INDUSTRIES*

HSI3100-0-ABCD-0-0
LOCAL BLOWER CONTROL PANEL
QTY 4
ELECTRICAL SCHEMATIC

JOB NO. 12-6133
DWG. NO. E-1.4
SCALE N.T.S.
SHEET
REV. A

CAD FILE:
TMC:
LST DATE: