REMOTE I/O
FRI300 SERIES

- *Discrete inputs and outputs directly connected to the fieldbus protocol;*
- *Input: Digital only. Foundation™ fieldbus or PROFIBUS PA with bus power;*
- *Instantiable Function Blocks, in the case of Foundation™ fieldbus, for regulatory and discrete control in the field;*
- *DI and DO Function Blocks in PROFIBUS PA;*
- *Allows fieldbus connection with conventional discrete equipment;*
- *Reduces the cost of wiring;*
- *Foundation™ fieldbus network link master capability;*
- *Supports EDDL, FDT/DTMs.*

PROFIBUS®

FOUNDATION™

Signal Converters

FRI300 Series

The FRI300 series makes it easier to integrate fieldbus and conventional signals, such as solenoids, pumps, motors, alarm generation, among others. It has two discrete inputs and two discrete outputs and can be assembled in the field without the need to run conventional cabling to the control room.

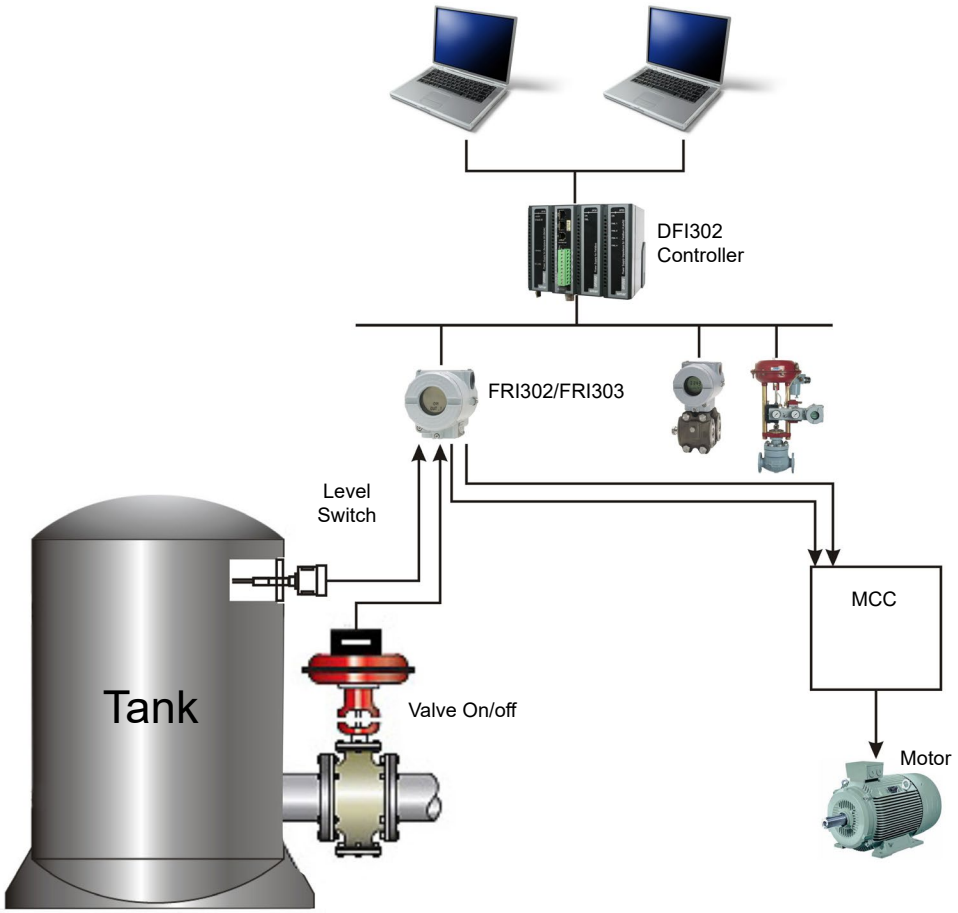
smar
Technology Company

Until all types of devices are available in Foundation fieldbus or Profibus PA systems, they will have to be a hybrid nature accepting both fieldbus and conventional signals. A mixed environment is inevitable during the transition to a fieldbus technology. The FRI300 Series makes integration of fieldbus and conventional I/O easy. Discrete devices such as pressure switches, push buttons, on/off valves, pumps and conveyors are integrated to the system over the PROFIBUS-PA field-level network using FRI303 or to the Foundation fieldbus system, using FRI302. FRI302/FRI303 are single and compact devices with easy installation.
The FRI300 Series is an integral part of SYSTEM302 but also integrates into other systems.

Easy Installation

The FRI302/FRI303 may be installed close to the conventional discrete elements, thereby eliminating long wire runs, associated marshalling panels and cable trays for the conventional output. With subsequent savings further reducing overall system costs.

The use of FRI302/FRI303 makes it possible to distribute outputs at various locations in the field and connect them via H1 bus.



Easy Configuration

The FRI302 is fully configured via Syscon using SYSTEM302 or any FOUNDATION™ Fieldbus configuration tool.

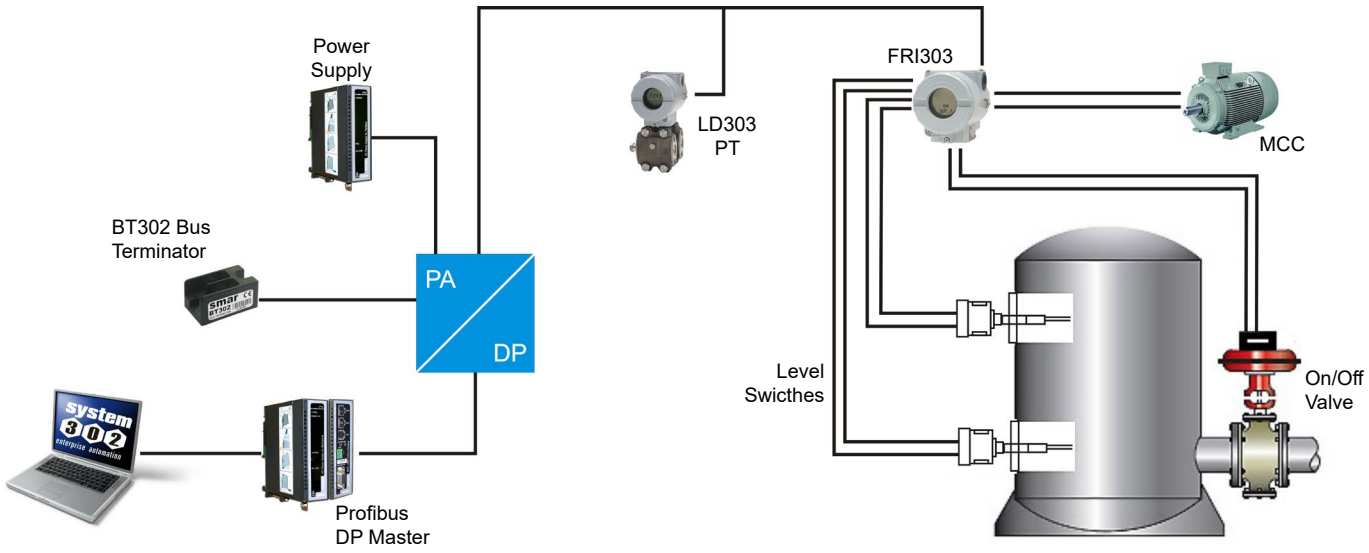
The FRI303 is fully configured through the SYSTEM302 or any other Profibus configuration tool based on EDDL or FDT/DTM.

Function Blocks

The FRI303 has 02 Discrete Input (DI) blocks and 02 Discrete Output (DO) blocks. The FRI302 has several built-in Function Blocks, such as Flip-Flop and Edge Trigger, Analog Alarm, Timer and Logic, Discrete Input, Discrete Output, Arithmetic, Input Selector, PID Controller and PID Step.

Conventional discrete I/O now works together with pure PROFIBUS PA or Foundation fieldbus devices on the same network and in the same loop. Output function blocks include standard safety mechanism in case of failures. Inputs and outputs are isolated from each other.

Application



General

Communication	Fieldbus on 31.25 kbit/s voltage mode according to IEC 61158-2.
Quiescent Current Consumption	17.5 mA from Fieldbus network.
Turn-on Time	Approximately 10 seconds.
Update Time	Approximately 0.5 second.
Humidity Limits	0 to 100% RH.
Function Blocks	The FRI303 has 02 Discrete Input (DI) blocks and 02 Discrete Output (DO) blocks. The FRI302 has several built-in Function Blocks, such as Flip-Flop and Edge Trigger, Analog Alarm, Timer and Logic, Discrete Input, Discrete Output, Arithmetic, Input Selector, PID Controller and PID Step.
Indication	Optional LCD indicator.
Temperature Limits	Operation: -40 to 85 ºC (-40 to 185 ºF). Storage: -40 to 85 ºC (-40 to 185 ºF). Display: -20 to 80 ºC (-4 to 176 ºF) Operation; -40 to 85 ºC (-40 to 185 ºF) without damage.
Vibration Effect	Meets SAMA PMC 31.1.
EMI	According to IEC 801.
Hardware	According to IEC 61158-2 and FISCO model.
Electrical Connection	1/2-14 NPT, PG 13.5 or M20 x 1.5.
Local Configuration	Using local adjustment magnetic tool if device is fitted with LCD display. Complete configuration is possible using PC software interface.
Configuration	FRI303: Via Profibus Communication using tools based on EDDL or FDT/DTM. FRI302: configured by Syscon in SYSTEM302 or by any other Fieldbus configuration tool.
Housing	Injected copper and aluminum with painted polyester or 316 Stainless Steel support, with O-Rings Buna-N on Cover (NEMA 4X, IP67).
Mounting	Wall, panel, or 2" pipe with optional bracket.
Weight	Nominal: 0.80 kg; Digital display adds: 0.13 kg; Mounting bracket adds: 0.60 kg.

FRI300 Relay Outputs

The outputs are designed with Solid State relays that are able to drive incandescence lamps, solenoids and other DC and AC loads.

When the output relays are N.C., if via function block is assigned a state “on” to the outputs, it means that the loads will be switched off.

When the output relays are N.O., if via function block is assigned a state “on” to the outputs, it means that the loads will be switched on.

Technical specifications for Normally Closed relays

Architecture	Number of Outputs: 2.
Switching Voltage	350 Vpeak.
Switching Current: AC mode	100 mA.
Switching Current: DC mode	165 mA.
On Resistance AC mode	18 Ω.
On Resistance DC mode	4.5 Ω.
Off State Resistance	Min: 0.1 GΩ. Typ: 1.4 GΩ.
Off State Leakage	Typ: 1.0 µA.
Turn On Time	5 ms.
Turn Off Time	1 ms.
Capacitance - Across Output	20 to 200 pF.
Thermal Offset Voltage	0.20 mV.
Output Status (load) with no power supply connected to the bus.	ON.
Output Status (load) During: Firmware Download	ON.
Output Status (load) During: Turn-on Time	ON.

Technical specifications for Normally Opened relays

Architecture	Number of Outputs: 2.
Switching Voltage	400 Vpeak.
Switching Current: AC mode	150 mA.
Switching Current: DC mode	250 mA.
On Resistance AC mode	18 Ω.
On Resistance DC mode	4.5 Ω.
Off State Resistance	Min: 0.5 GΩ. Typ: 5000 GΩ.
Off State Leakage	Typ: 0.5 µA.
Turn On Time	5 ms.
Turn Off Time	1 ms.
Capacitance - Across Output	10 to 95 pF.
Thermal Offset Voltage	0.20 mV.
Output Status (load) with no power supply connected to the bus.	OFF.
Output Status (load) During: Firmware Download	OFF.
Output Status (load) During: Turn-on Time	OFF.

Technical Specifications for Dry Contact Input

Digital Input	2 (two) dry contact inputs electrically isolated from each other: • Resistance value lower than 2K: close contact; • Resistance value upper than 3K5: open contact.

Ordering Code

MODEL

FRI302 — **FOUNDATION FIELDBUS REMOTE I/O**

COD. — Local Indicator

COD.	
0	Without Indicator
1	With Digital Indicator

COD. — Relay Output Conditions

COD.	
1	Both Normally Open (N.O.)
2	Both Normally Closed (N.C.)
3	One N.O. and other N.C.

COD. — Mounting Bracket for 2" Pipe Mounting

COD.	
0	Without Bracket
1	Bracket and accessories in Carbon Steel
2	Bracket and accessories in 316 SST

COD. — Electrical Connections

COD.	
0	1/2-14 NPT
A	M20 x 1.5
B	PG 13.5 DIN

COD. — Housing

COD.	
H0	Aluminum (IP/TYPE)
H1	316 SST (IP/TYPE)

COD. — Identification Plate

COD.	
I6	Without certification

COD. — Painting

COD.	
P0	Gray Munsell N6.5
P1	Safety Blue Epoxy – Immersion Condition-Petrobras N1021
P2	Safety Blue Epoxy – Atmospheric Zone - Petrobras N1021
P8	Without painting
P9	Blue Safety Epoxy

COD. — Manufacturing Standard

COD.	
S0	SMAR

COD. — Tag Plate

COD.	
J0	With tag
J1	Blank
J2	According notes

FRI302 - 1 | 1 - 1 | 0 / H0 | I6 | P0 | S0 | J0 ← TYPICAL MODEL

* Leave it blank for no optional items

MODEL

FRI303 — **PROFIBUS-PA REMOTE I/O**

COD. — Local Indicator

COD.	
0	Without Indicator
1	With Digital Indicator

COD. — Relay Output Conditions

COD.	
1	Both Normally Open (N.O.)
2	Both Normally Closed (N.C.)
3	One N.O. and other N.C.

COD. — Mounting Bracket for 2" Pipe Mounting

COD.	
0	Without Bracket
1	Bracket and accessories in Carbon Steel
2	Bracket and accessories in 316 SST

COD. — Electrical Connections

COD.	
0	1/2-14 NPT
A	M20 x 1.5
B	PG 13.5 DIN

COD. — Housing

COD.	
H0	Aluminum (IP/TYPE)
H1	316 SST (IP/TYPE)

COD. — Identification Plate

COD.	
I6	Without certification

COD. — Painting

COD.	
P0	Gray Munsell N6.5
P3	Safety Blue Epoxy – Immersion Condition-Petrobras N1021
P8	Safety Blue Epoxy – Atmospheric Zone - Petrobras N1021
P9	Without painting
PC	Blue Safety Epoxy

COD. — Manufacturing Standard

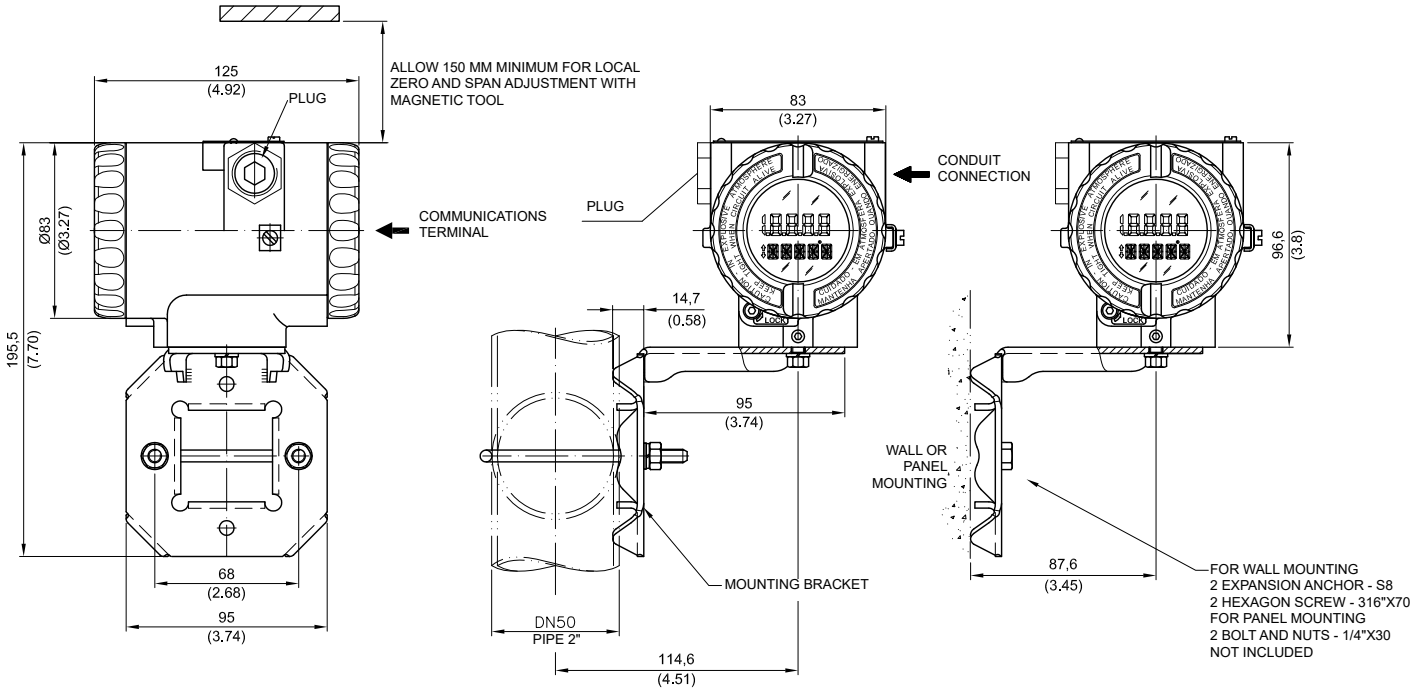
COD.	
S0	SMAR

COD. — Tag Plate

COD.	
J0	With tag
J1	Blank

FRI303 - 1 | 1 - 1 | 0 / H0 | I6 | P0 | S0 | J0 ← TYPICAL MODEL

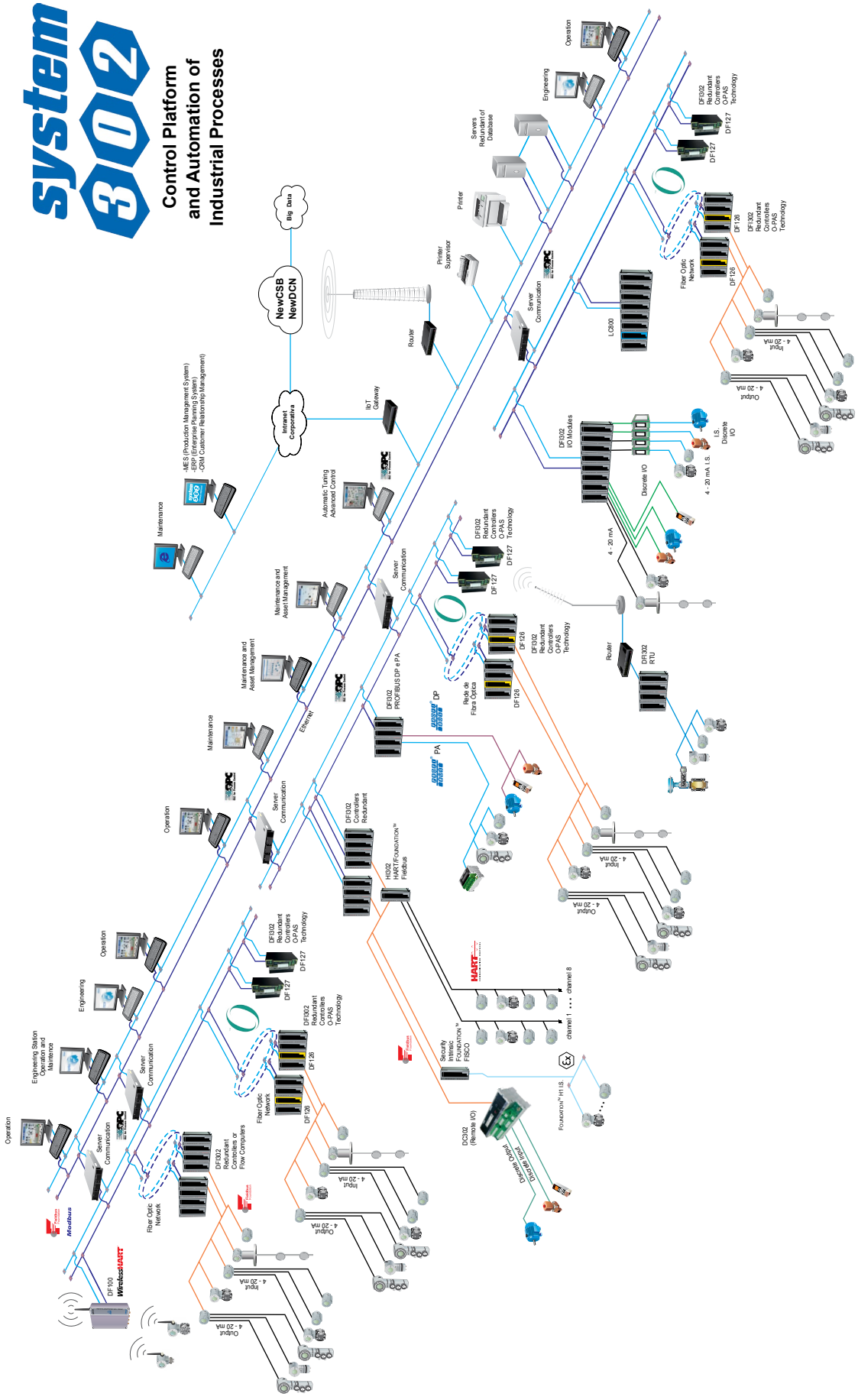
* Leave it blank for no optional items


125
(4.92)
PLUG
ALLOW 150 MM MINIMUM FOR LOCAL
ZERO AND SPAN ADJUSTMENT WITH
MAGNETIC TOOL
Ø83
(Ø3.27)
195,5
(7.70)
COMMUNICATIONS
TERMINAL
68
(2.68)
95
(3.74)
83
(3.27)
PLUG
CONDUIT
CONNECTION
14,7
(0.58)
95
(3.74)
MOUNTING BRACKET
DN50
PIPE 2"
114,6
(4.51)
96,6
(3.8)
WALL OR
PANEL
MOUNTING
87,6
(3.45)
FOR WALL MOUNTING
2 EXPANSION ANCHOR - S8
2 HEXAGON SCREW - 316"X70
FOR PANEL MOUNTING
2 BOLT AND NUTS - 1/4"X30
NOT INCLUDED

SYSTEM302 Architecture

system 302

Control Platform and Automation of Industrial Processes



PROVIDING RELIABLE CHOICES

DESIGNED FOR INDUSTRY 4.0

FRI300 Series

Remote I/O

Consult our representatives

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