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B-1029

INSTRUCTION SHEET

For AS-Interface Safety at Work Slaves
VAA-*-PM-*

Thank you for purchasing this Pepperl+Fuchs product. This AS-Interface Safety at Work compatible e-stop is designed for panel mount applications. Before installing, wiring, operating this product or performing maintenance and inspections on this product, please read this documents carefully. After reading, keep this documents handy or make sure to deliver it to the end user. Note that handling this product requires expert knowledge about electricity.

SAFETY NOTE

This product is manufactured in our tightly controlled production environment. In this instruction sheet, the dangers expected to occur due to improper handling are described where ever you see the "Warning" or "Caution" indicator. These indicators have the following meaning:

⚠ WARNING

Warning notices are used to emphasize that improper operation may cause severe personal injury or death.

⚠ CAUTION

Caution notices are used where negligence might cause personal injury or damage to equipment.

⚠ WARNING
Before using this product, carefully read the manuals for the AS-Interface SafetyMonitor (from this point simply called SafetyMonitor) and the SafetyMonitor configuration software (VAZ-ASIMON.) These manuals provide additional information about installation, setup, operation, and maintenance of this product.

⚠ WARNING
Be sure to turn off the AS-Interface power supply before installing, removing, wiring, maintenance or operation of the product. Otherwise it may result in an electrical shock or a fire.

⚠ WARNING
Operations other than those described in this instruction sheet can cause damage to this product or a connected system, preventing the product to perform its intended function. Do not modify this product since a modified product is not guaranteed. Use this product according to the local safety standard and related laws and regulations.

⚠ WARNING
Using this product for purposes different from those specified may cause danger to an operator or damage to the system itself. Installation of this product must be conducted by the trained person, following the instructions in this instruction sheet. When using this product as a slave in a safety related application, be sure to use it in combination with an AS-Interface SafetyMonitor (VAS-*A-K12-…) having the appropriate safety approvals according to local regulations and standards. Refer to the user manual of your SafetyMonitor and the chapter giving connection examples in this instruction sheet. Also, check all safety functions including safety-related equipment before activating normal operation.

⚠ WARNING
Perform a functional test on this product at least once a year. Do not disassemble, repair, or modify this product. Otherwise, the primary safety features of this product may be lost.

1　Type

This data sheet covers two different product variants of the panel mount housing style:
Panel mount e-stop without illumination: VAA-2E-PM-S-V1
Panel mount e-stop with illumination: VAA-2E1A-PM-S-V1
Both products can be connected to AS-Interface using crimp connectors or with the provided connection cable offering cable leads. The size of push button is φ40 mm.

2　Application

This product is an emergency stop button compatible with the AS-Interface Safety at Work. When used in combination with an appropriately configured SafetyMonitor, this button operates as an emergency stop button for applications up to safety category 4 according to EN954-1 and SIL 3 according to IEC61508. For this purpose, this product generates a 8x4 bit safety code defined specifically for this device. One 4-bit entry is transmitted to an AS-Interface gateway/scanner (e.g. VBG-PB-K20-D) per network scan. At the same time, the data is checked by the SafetyMonitor. The safety circuit consists of this product, the SafetyMonitor, and possibly a safety contactor connected to the OSSD (Output Signal Switching Device) of the SafetyMonitor.

3　Laws and Regulations

- IEC61508: 1998-2000, Parts1-7
- EN62061 : 2005
- EN60204-1 : 2006
- EN61000-6-2 : 2005
- NFPA79: 2002
- EN954-1 : 1996
- IEC60947-5-5: 1997
- EN50295 : 1999
- EN61000-6-4 : 2001

4　Probability of Failure on Demand (PFD) and Probability of Failure per Hour (PFH)

This product has the following Probability of Failure on Demand (PFD) and Probability of Failure per Hour (PFH). However, to satisfy SIL requirements, calculation of PFD and PFH is needed for all devices comprising the system.

PFD	4.38×10^{-5}
PFH	1.00×10^{-9}

5　Specifications

Electrical specifications

Rated operating voltage Ue	26.5 to 31.6 V (from AS-Interface network)
Rated operating current Ie (when Ue = 30.5V)	< 25mA (Non-illuminated) < 40mA (Illuminated)

Input specifications

Number of inputs	2 channel inputs (positive opening mechanism)

Output specifications

Number of output points/specifications	1 / Illuminating red LED (only on devices with illumination)

AS-Interface Specification

Slave type		Safety slave
Maximum network segment length		100 meters total per segment
Maximum number of slaves in the network		31 (when only safety slaves are connected)
Profile (I/O . ID . ID2)		S-0.B.E (Non-illuminated) S-7.B.E (Illuminated)
Data bit	When emergency button is pressed (STOP mode.)	DI0　DI1　DI2　DI3 0　　0　　0　　0
Input	When emergency button is not pressed (RUN mode).	DI0　DI1　DI2　DI3 X　　X　　X　　X X: 0,1 (8 x 4 bit unique safety code sequence, toggling)
Output	DO1 to DO3 unused	DO0 = 1 Illumination ON DO0 = 0 Illumination OFF
Parameter bit		Not used

Environment

Operating temperature	-25 to 55°C(non freezing)
Storage temperature	-40 to 70°C(non freezing)
Operating humidity	45 to 85% RH (non condensing)

Structural specifications

|	
Operating force	Push lock: 32 N Pull reset: 21 N Turn rest: 0.27 N·m
Minimum operating force of direct break	80 N
Minimum operating distance for direct circuit breaking	4.0 mm
Maximum operating distance	4.5 mm
Insulation resistance	100 MΩ or higher (500 VDC mega)
Pollution degree	3(operator unit) 2(AS-Interface communication unit)
Impact resistance	Normal operation: 15G, 11ms Not destroyed: 100G
Vibration Resistance	Operating extremes: 10 to 500Hz, amplitude 0.35mm, acceleration 50m/s², 2 hours per axis on each of XYZ axes
Life time	Mechanical / Electrical: 250000 times or more
Protective structure	IP65 (operator unit) IP20 (AS-Interface communication unit)
Recommended tightening torque for locking ring	2.0 N·m
Weight	φ40 type: 60 g, φ60 type:70 g
Connector	Crimp connector: (JST Corp) Leaded adapter cable provided
Applicable cable	Crimp connector: AWG20

6　Reset Operation

This product is a push-locking, pull- or turn-resetting emergency stop button. When the button is pressed, it will be locked locked. The button is reset by pulling or turning.

Pull reset　　Turn reset
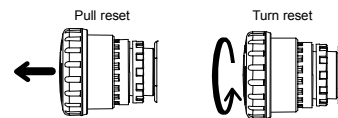
⚠ CAUTION
Do not expose the button to excessive shock and vibration, or it may be deformed or damaged, causing malfunction or fail during operation.
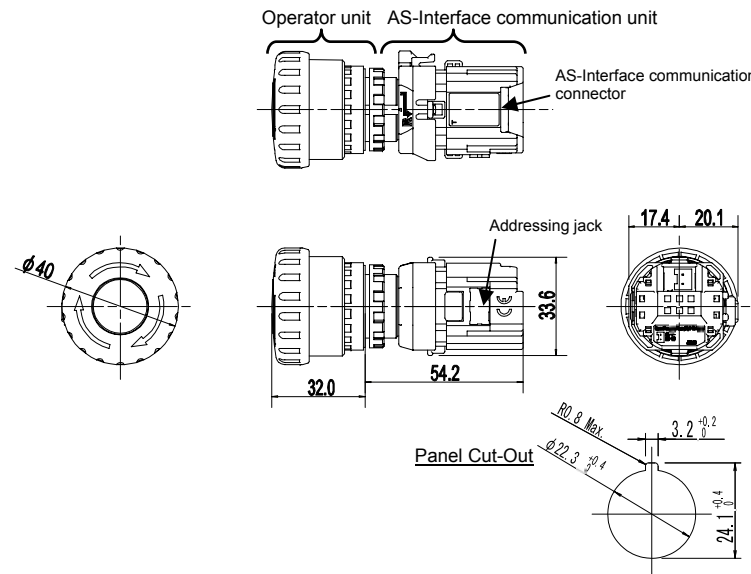
7　Pin Assign
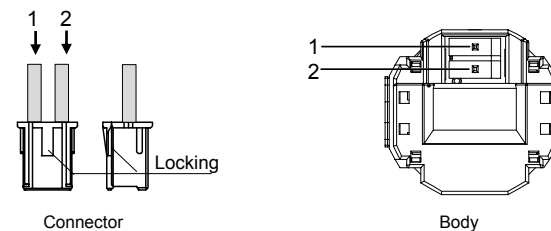
Connector　　　　　Body

Crimp connector: suitable leaded adapter cable provided

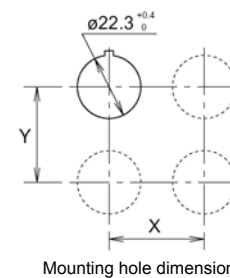**1**: AS-i – (Cable color: blue) **2**: AS-i + (Cable color: brown)

⚠ CAUTION
The crimp connector is secured using a locking mechanism designed to prevent inadvertent disconnection. Pull the connector while pressing the locking knob.

8　Dimensions

Operator unit　AS-Interface communication unit

AS-Interface communication connector

Addressing jack

17.4　20.1

33.6

32.0　　54.2

Panel Cut-Out

9　Mounting Hole Layout

| X axis	Y axis
Min 50mm	Min 50mm

ø22.3

Mounting hole dimension

⚠ CAUTION
In order to access the pins used to assign an AS-Interface address, at least 60mm of clearance is necessary on the left side of the unit. Note that e-stop buttons mounted at the "minimum mounting separation" will not offer enough space to access these pins. If adequate space cannot be allocated, set the address before installing the product in the panel or set the address after removing the AS-Interface communication unit from the operation section.

Programming cable
60.0
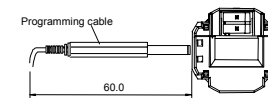
10　Installation

-Removing the AS-Interface communication unit
First unlock the operator button. Grab the bayonet ring (1) and pull it back until the latch pin (2) clicks, then turn the AS-Interface communication unit counter clockwise and pull it out (3)


(3) Turn counterclockwise
(1) Grab
Bayonet ring
(2) Pull
(1) Grab
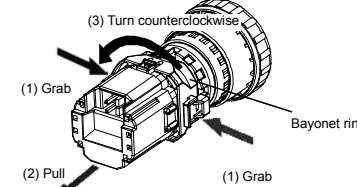
⚠ CAUTION
Notes for removing the AS-Interface communication unit
(1) While removing the AS-Interface communication unit, do not exert excessive force, or the button may be damaged.
(2) On illuminated e-stop buttons an LED lamp is built into the AS-Interface communication unit. When removing the AS-Interface communication unit, pull it out straight to prevent damage to the LED bulb. If excessive force is exerted, the LED bulb may be damaged.

- Panel Mounting
Remove the locking ring from the operator and check that the rubber gasket is in place. Insert the operator from the front of the panel. Rotate the operator such that the unthreaded side marked TOP faces upward, and tighten the locking ring to a torque of 2.0 Nm maximum.


Operator without thread
Operator without thread TOP Marking
Rubber gasket
Locking ring
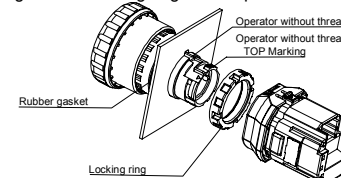
⚠ CAUTION
Notes for panel mounting
The panel thickness should be between 0.8 to 6.0 mm.

To prevent these panel mount e-stop buttons from rotating when resetting from the latched STOP position, use of an anti-rotation locking washer or a legend plate (nameplate, emergency stop plate…) is recommended.

-Installing the AS-Interface communication unit
First unlock the operator button. Align the small ▼ marking on the edge of the operator with the small ▲ marking on the yellow bayonet ring. Hold the AS-Interface communication unit, not the bayonet ring. Press the AS-Interface communication unit onto the operator and turn the AS-Interface communication unit clockwise until the bayonet ring clicks.

▼Mark
▲Mark
Turn clockwise
Push
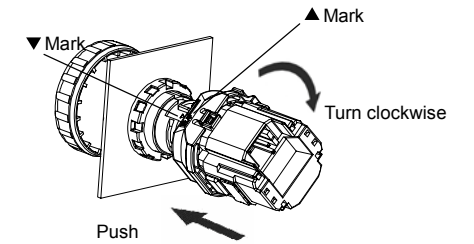
⚠ CAUTION
Notes for installing the AS-Interface communication unit
Make sure that the bayonet ring is in the locked position. Check that the two projections on the bayonet ring are securely in place.


Projection
Latched　　Unlatched
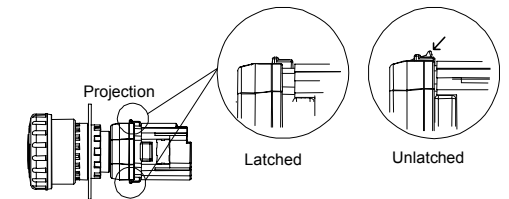
11　Addressing

Turn off the power and then remove the cover protecting the addressing jack on the communication unit. Connect the programming cable (VAZ-PK-1.5M-V1-G) to the hand held address device (VBP-HH1) and insert the cinch connector on the programming cable into the addressing jack on the communication unit on the button. Set a valid. After setting the address, be sure to replace the cover protecting the addressing jack. Setting an As-Interface address on the button is also possible using the AS-Interface gateway/scanner. Refer to the manual of your AS-Interface gateway/scanner for more details. The allowable address range is 1 through 31. The default address of all AS-Interface devices leaving Pepperl+Fuchs is "0".
Refer to the user manual of the handheld addressing unit for details on its operation.

-Connecting the programming cable for VAA address setting device
The programming jack cover on the side of the unit can be removed by carefully prying it out. Make sure not to lose the cover as it comes off completely. By removing the cover, you are able to see the terminals for connecting a programming cable. Connect the programming cable to the terminals

Lid of addressing port
Addressing port for connecting the programming cable is under the lid
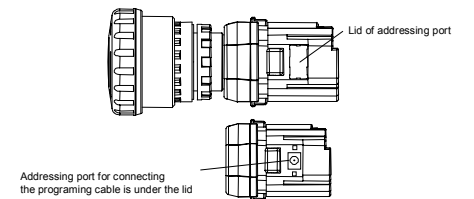
12　Wiring

Installation of this product to the AS-Interface network is accomplished using the provided adapter cable. When connecting to AS-Interface flat cable you may use a tap-off splitter with wire terminals (VAZ-T1-FK-CLAMP1.)
A special tool is necessary to use the integrated crimp connector.

⚠ CAUTION
Setting up the AS-Interface network
The maximum length of an AS-Interface segment must not exceed 100 meters, cumulative. This includes all cables on flat-to-round cable converters. Consider the lengths of cables and wiring topology so that voltage drops in transmission lines are no higher than 3V.
Ideally ASA-interface networks are setup using the AS-Interface flat cable.

A maximum of 31 e-stop buttons can be connected to a network. Each AS-Interface node (e-stop buttons or any other type of node) must have a unique address; duplicate addresses must be avoided!
AS-interface allows operation of safety slaves connected to safety equipment and standard slaves connected to standard non-safety equipment at the same time. Do not connect safety related signals to a standard non-safe slave.
Many AS-Interface slaves support A/B addressing (extended addressing) effectively allowing two nodes per AS-Interface address. One such slave must be at the A-address while the other must occupy the B-address. This e-stop button uses a full AS-Interface address.
If A/B slaves and full address slaves are connected simultaneously, the maximum number of slaves connectable to a network may exceed 31.

13　Setting Safety Monitor

When configuring the SafetyMonitor to evaluate the safety data from this product, use a "Double channel dependent, debounced contacts" monitored device.

 Double channel dependent, debounced contacts