

Table 68 - 1732ES Modules – Technical Specifications (continued)

Attribute	Value
Internal resistance from sourcing to sinking terminal	1732ES-IB12XOBV2: 3.25 kΩ 1732ES-IB12XOB4: N/A
Short circuit detection	Yes (short high and low and cross-circuit fault detection)
Short circuit protection	Electronic
Pilot duty rating	1732ES-IB12XOBV2: 2.5 A inrush 1732ES-IB12XOB4: N/A
Number of outputs	Safety outputs 1732ES-IB12XOB4 module, 4 sourcing outputs 1732ES-IB12XOBV2 module, 4 bipolar outputs, (2 pairs)
Sensor power output current rating (pins 1, 3, and 5 of each output signal I/O connector)	2 A max per point at 40 °C (104 °F) 1 A max per point at 55 °C (131 °F) (see Product temperature versus sensor power current derating (per pin) on page 127)

(1) Includes the presence of a single sourcing output stuck-high or sinking output stuck-low fault.

Table 69 - 1732ES Modules – General

Attribute	Value
Enclosure type rating	Meets IP65/IP67 (when marked)
Product current consumption (not including Test output or Safety output load current)	1732ES-IB12XOBV2: <ul style="list-style-type: none"> In power (no load): 19.2...28.8V DC, 175 mA at 24V DC Out power (no load): 19.2...28.8V DC, 65 mA at 24V DC 1732ES-IB12XOB4: <ul style="list-style-type: none"> In power (no load): 19.2...28.8V DC, 175 mA at 24V DC Out power (no load): 19.2...28.8V DC, 45 mA at 24V DC
Operating voltage range	19.2...28.8V DC (24V DC, -20...20%)
Module power connector rating	10 A max per pin
Isolation voltage	50V (continuous), Basic Type, Input Power and I/O to Ethernet, Input Power and I/O to Output Power and IO, and Output Power and IO to Ethernet Tested at 707V DC for 60s
Product temperature versus pulse test output current derating	<p style="text-align: center;">Product Temperature Versus Pulse Test Output Current Derating</p>

Table 69 - 1732ES Modules – General (continued)

Attribute	Value
Product temperature versus sensor power current derating (per pin)	<p style="text-align: center;">Product Temperature Versus Sensor Power Current Derating (per pin)</p>
Wiring category ⁽¹⁾	2 - on signal ports 2 - on power ports 2 - on communication ports
Weight, approx.	786 g (1.73 lb)
Dimensions (HxWxD), approx.	70 x 259 x 69 mm (2.8 x 10.2 x 2.7 in.) without cables

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

Environmental Specifications

This section provides environmental specifications for the modules.

- For 1791ES modules, see [Table 70 on page 127](#).
- For 1732ES modules, see [Table 71 on page 128](#).

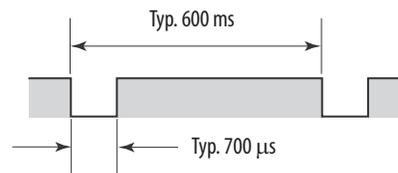
Table 70 - 1791ES Modules – Environmental Specifications

Attribute	Value
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20...60 °C (-4...140 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40...85 °C (-40...185 °F)
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5...95% noncondensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g at 10...500 Hz
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g
Emissions	CISPR 11: Group 1, Class A
ESD immunity	IEC 61000-4-2: 8 kV contact discharges 10 kV air discharges

Table 70 - 1791ES Modules – Environmental Specifications (continued)

Attribute	Value
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
EFT/B immunity	IEC 61000-4-4: ±4 kV at 5 kHz on power ports ±3 kV at 5 kHz on signal ports ±2 kV at 5 kHz on communication ports
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports ±2 kV line-earth (CM) on communication ports
Reaction time	
Input reaction time, max	16.2 ms + set values of ON/OFF delays
Output reaction time, max	6.2 ms + (20 ms) relay response time

Signal sequence



While safety outputs are in an on state, the signal sequence shown in the figure is output continuously for fault diagnosis. Confirm response time of device connected to safety outputs so the device does not malfunction due to off pulse.

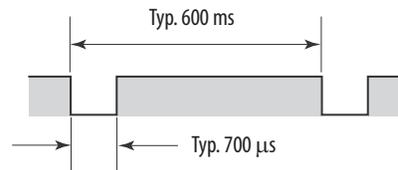
Table 71 - 1732ES Modules – Environmental Specifications

Attribute	Value
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20...85 °C (-4...185 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40...85 °C (-40...185 °F)
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5...95% noncondensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g at 10...500 Hz
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g
Emissions	IEC 61000-6-4

Table 71 - 1732ES Modules – Environmental Specifications (continued)

Attribute	Value
ESD immunity	IEC 61000-4-2: 4 kV contact discharges 10 kV air discharges
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz 3V/m with 1 kHz sine-wave 80% AM from 2700...6000 MHz
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV at 5 kHz on power ports ±1 kV at 5 kHz on signal ports ±1 kV at 5 kHz on communication ports
Surge transient immunity	IEC 61000-4-5: ±2 kV line-earth (CM) on power ports ±2 kV line-earth (CM) on signal ports ±2 kV line-earth (CM) on communication ports
Reaction time	
Input reaction time, max	16.2 ms + set values of ON/OFF delays
Output reaction time, max	6.2 ms + (20 ms) relay response time

Signal sequence



While safety outputs are in an on state, the signal sequence shown in the figure is output continuously for fault diagnosis. Confirm response time of device connected to safety outputs so the device does not malfunction due to off pulse.