

SHUTTER PRODUCTS COMPARISON SPECIFICATIONS



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Thank you for your interest in UNIBLITZ® shutters by Vincent Associates. Since 1969, Vincent Associates has been supplying the UNIBLITZ electro-programmable shutter systems worldwide, addressing numerous demanding applications on earth as well as space born! The purpose of this page is to provide comparative information regarding the UNIBLITZ shutter concept, common aspects found among the various series, a general comparison of types, and operating parameters of the individual series. From here you can select sheets providing information specific to the individual shutter series of your interest.

The UNIBLITZ shutter is based on an electro-magnetic actuator. The shutter is actuated by applying an electronic pulse to the shutter, varying its intensity during the shutter's exposure sequence, then removing the pulse to close the shutter. All UNIBLITZ shutters are compatible with our UNIBLITZ shutter drive equipment (unless specified), which converts line voltages to that necessary to operate the shutter. Nomenclature specific to UNIBLITZ shutters may be used throughout these sheets, notably Opening Bounce and Closing Bounce (see mechanical

specifications). The amount of "Bounce" specified is the maximum allowed for a Vincent, UNIBLITZ shutter. Opening Bounce is the maximum amount the blades will come back into the aperture when they have traveled to full open. Closing Bounce is the maximum amount the blades will open after the shutter has returned to the closed position. The amount specified is a percentage of the specific aperture diameter.

ELECTRICAL, MECHANICAL, TIMING, and OPTICAL specifications are on the following pages. Additional specifications and product options information can be found in the series specific data sheets. If you need specific information not listed, please review our sites' Resource and Company Info sections. If you still need further information please contact one of our technical representatives at vincentassociates@uniblitz.com or telephone (800)828-6972. Contact information is located at <http://www.uniblitz.com/contact.asp>

UNIBLITZ Shutters by Vincent Associates - Setting the Global Standards for Shutter Technology!

ELECTRICAL

UNIBLITZ electronic drive equipment converts line voltage to that necessary to operate all UNIBLITZ shutters. If the user is to design custom OEM drive circuitry, it is highly recommended to contact one of our technical representatives for design assistance.

SERIES	COIL RESISTANCE	PULSE VOLTAGE TO OPEN	HOLD VOLTAGE ¹ (NOMINAL)
BDS25	12 OHMS (OPEN) 12 OHMS (CLOSE)	+65VDC (OPEN) +65 VDC (CLOSE)	N/A (BOTH COILS)
CS25	12 OHMS	+65 VDC	+5 VDC
CS35	12 OHMS	+70 VDC	+7 VDC/+5VDC ²
CS45	12 OHMS	+70 VDC	+7 VDC/+5VDC ²
CS65	12 OHMS	+70 VDC	+7VDC/+5VDC ²
CS90	12 OHMS (each coil)	+70VDC Primary +7VDC Aux ³	+7VDC/+5VDC Primary
LS2	48 OHMS	+65 VDC	+10 VDC
LS3	48 OHMS	+65 VDC	+10 VDC
LS6	48 OHMS	+65 VDC	+10 VDC
QCS45	12 OHMS	+70 VDC	+7 VDC/+5VDC ²
UHS1	12 OHMS (each coil)	+65 VDC	+5 VDC
VS14	12 OHMS	+65 VDC	+5 VDC
VS25	12 OHMS	+65 VDC	+5 VDC
VS35	12 OHMS	+70 VDC	+7VDC/+5VDC ²
XRS14	12 OHMS	+65 VDC	+5 VDC
XRS25	12 OHMS (each coil)	+65 VDC	+5 VDC
XRS6	12 OHMS	+65 VDC	+5 VDC

¹Voltage level required across actuator coil when being held in the open position

²Dual hold voltage level driver system included in UNIBLITZ VMM/VCM shutter controller.

³Drive system is on-board for CS90 auxiliary actuator. When using a UNIBLITZ drive system (i.e. VMM or VCM series) 7.0VDC level is supplied. When operating this device without UNIBLITZ drive equipment, (i.e. using a driver of your own design, etc.) please request and review the CS90 Shutter Electrical Configuration Layout.

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MECHANICAL

All UNIBLITZ shutters are properly lubricated prior to leaving the factory. Subsequent lubrication by the user will render the shutter inoperable and unreparable.

SERIES	WEIGHT UNCASED	WEIGHT CASED	OPERATING TEMP DEGREES	MAX. OPENING BOUNCE	MAX. CLOSING BOUNCE	MAX. FREQUENCY OF OPERATION (CONT/BURST) ⁴	NUMBER SHUTTER BLADES
BDS25	1.29 oz. (.04 kg)	2.89 oz. (.09 kg)	0-80°C	15%	5%	N/A	5
CS25	1.28 oz. (.04 kg)	3.16 oz. (.09 kg)	0-80°C	15%	5%	5 Hz / 30 Hz	5
CS35	1.64 oz. (0.05 kg)	6.70 oz. (0.19 kg)	0-80°C	15%	5%	2.5 Hz / 15 Hz	5
CS45	3.17 oz. (.09 kg)	9.15 oz. (.26 kg)	0-80°C	15%	5%	2.5 Hz / 15 Hz	5
CS65	4.0 oz. (.112 kg)	13.2 oz. (.374 kg)	0-80°C	15%	5%	2 Hz / 5 Hz	6
CS90	7.96 oz. (.23 kg)	20.04 oz. (.57 kg)	0-80°C	15%	5%	1 Hz / 3 Hz	6
LS2	N/A	7.41 oz. (.21 kg)	0-80°C	15%	5%	100 Hz / 400 Hz	1
LS3	N/A	7.41 oz. (.21 kg)	0-80°C	15%	5%	50 Hz / 200 Hz	2
LS6	N/A	7.41 oz. (.21 kg)	0-80°C	15%	5%	20 Hz / 150 Hz	2
QCS45	3.72 oz. (0.11 kg)	9.15 oz. (.26 kg)	0-80°C	15%	5%	2.5 Hz / 15 Hz	5
UHS1	N/A	7.46 oz. (.21 kg)	0-80°C	15%	5%	100 Hz / 400 Hz	2
VS14	2.05 oz. (.06 kg)	10.22 oz. (.29 kg)	0-80°C	15%	5%	10 Hz / 40 Hz	2
VS25	2.05 oz. (.07 kg)	10.22 oz. (.29 kg)	0-80°C	15%	5%	10 Hz / 40 Hz	2
VS35	2.33 oz. (.07 kg)	14.35 oz. (.41 kg)	0-80°C	15%	5%	5 Hz / 20 Hz	2
XRS14	2.18 oz. (.06 kg)	10.35 oz. (.29 kg)	0-80°C	15%	5%	2 Hz / 10 Hz	1
XRS25	4.40 oz. (.13 kg)	12.98 oz. (.37 kg)	0-80°C	15%	5%	2 Hz / 10 Hz	2
XRS6	1.20 oz. (.04 kg)	7.46 oz. (.21 kg)	0-80°C	15%	5%	10 Hz / 50 Hz	1

⁴CONTinuous frequency rating specified at shutter's minimum exposure pulse. BURST frequency rating specified for (4) four seconds maximum with a (1) one minute minimum between bursts. Frequency measurements are taken in free air, 25°C ambient, actuator coil equipped with heat sink. For additional information on maximum sustained frequencies obtainable, please contact one of our technical representatives.

Timing of Pulse Input and Synchronization Output Relative to Shutter State

Typical timing values (msec.) using UNIBLITZ drive equipment and measured with UNIBLITZ shutters equipped with standard black TEFLON® ("T") coated or polished stainless steel ("S") shutter blades. Typically add 10% (for LS series) and 30% (for VS and the UHS series) to each of the timing specifications when utilizing AISiO ("Z") or AlMgF2 ("ZM") coated blades. (Note timing is the same for all blade finishes and coatings for the VS35 and all CS type shutters. XRS shutters are not available with these coatings.)

TYPICAL PULSE INPUT TO CONTROLLER

SHUTTER STATE

TYPICAL ELECTRONIC SYNCHRONIZATION OUTPUT FROM CONTROLLER

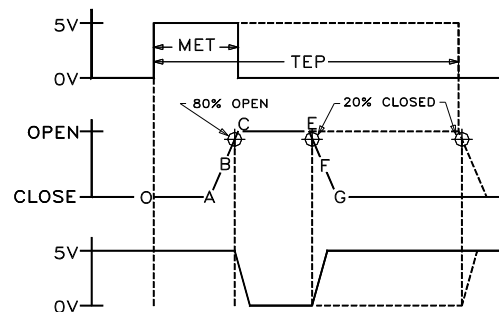


Figure 1

TIMING

SERIES	O-A DELAY TIME ON OPENING AFTER CURRENT IS APPLIED	A-C TRANSFER TIME ON OPENING	O-C TOTAL OPENING TIME	C-E MINIMUM DWELL TIME WITH MINIMUM INPUT PULSE	B-F MINIMUM EQUIVALENT EXPOSURE TIME	E-G TRANSFER TIME ON CLOSING	A-G TOTAL WINDOW TIME	MET MINIMUM EXPOSURE TIME	TEP TYPICAL EXPOSURE PULSE
BDS25	6.0	13.0	19.0	12.0	26.5	16.0	41.0	25.0	>25.0
CS25	3.0	9.0	12.0	6.0	17.5	14.0	29.0	15.0	>15.0
CS35	4.0	13.0	17.0	10.0	31.5	30.0	53.0	20.0	>20.0
CS45	6.0	14.0	20.0	12.0	31.0	24.0	50.0	25.0	>25.0
CS65	6.0	29.0	35.0	18.0	60.0	55.0	102.0	40.0	>40.0
CS90	20.0	70.0	90.0	20.0	100.0	90.0	180.0	100.0	>100.0
LS2	0.7	0.3	1.0	0.7	1.1	0.5	1.5	1.0	>1.7
LS3	1.0	0.5	1.5	0.8	1.35	0.6	1.9	2.0	>2.3
LS6	1.0	0.7	1.7	0.8	1.55	0.8	2.3	2.0	>2.5
QCS45	6.0	14.0	20.0	12.0	31.0	24.0	50.0	25.0	>25.0
UHS1 (High/Norm)	0.54/0.54	0.18/0.18	0.72/0.72/	0.05/0.70	0.20/0.93	0.12/0.28	0.35/1.00	0.60/0.60	N/A />100
VS14	2.0	1.5	3.5	2.0	4.25	3.0	6.5	4.0	>6.5
VS25	3.0	3.0	6.0	2.0	6.0	5.0	10.0	6.0	>8.0
VS35	5.0	13.0	18.0	5.0	17.5	12.0	30.0	20.0	>23.0
XRS14	5.0	20.0	25.0	5.0	20.0	10.0	35.0	25.0	>25.0
XRS25	6.0	10.0	16.0	5.0	17.5	15.0	30.0	20.0	>20.0
XRS6	1.2	3.2	4.4	2.0	6.0	4.8	10.0	5.0	>6.4

The question regarding enhancement of shutter speed with the application of user supplied lubricants has been repeatedly asked. It is our experience that lubricating the shutter blades will actually slow the shutter down and eventually render the shutter inoperable. UNDER NO CIRCUMSTANCES SHOULD ANY TYPE OF LUBRICANT BE APPLIED TO THE SHUTTER BLADE AREA.

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OPTICAL

When using UNIBLITZ shutters with coherent and noncoherent light sources (such as lasers or high power lamps used in microscopes) the power output from these sources may require the need to protect the Shutter's blade surface from the source's damaging effects. To accomplish this, most UNIBLITZ shutters are available with three optional blade finishes/coatings. The standard finish is black TEFLON® over a stainless steel substrate on both the input and output sides. As an alternate to the standard finish, a polished stainless steel ("S") finish is offered. Choices of AlSiO ("Z") and AlMgF2 ("ZM") coatings over a BeCu substrate are also available. It is intended that the user's light source be input to the reflective

side only.* When considering a coated shutter blade (over a BeCu substrate) as an option, please keep in mind that the timing specifications will differ slightly from the published specifications found in the timing section of this data sheet. Typically add 10% (for the LS series) and 30% (for the VS series) to published timing specifications with shutters equipped with coated blades, excluding the CS25, VS35 and larger apertures. (Note timing is the same for all blade finishes and coatings for CS25, VS35 and larger type shutters.) The user may also wish to review the Laser Application Reference Sheet located in the resource section.

COATINGS

SHUTTER MODEL	ULTRAVIOLET .3-.4µm (microns)		VISIBLE .4-.75µm (microns)		INFRARED .75-.106µm (microns)	
	AlSiO	AlMgF ₂	AlSiO	AlMgF ₂	AlSiO	AlMgF ₂
BDS25	N/A	5 W/mm ²	10 W/mm ²	5 W/mm ²	5 W/mm ²	5 W/mm ²
CS25	N/A	5 W/mm ²	10 W/mm ²	5 W/mm ²	5 W/mm ²	5 W/mm ²
CS35	N/A	5 W/mm ²	10 W/mm ²	5 W/mm ²	5 W/mm ²	5 W/mm ²
CS45	N/A	5 W/mm ²	10 W/mm ²	5 W/mm ²	5 W/mm ²	5 W/mm ²
CS65	N/A	5 W/mm ²	10 W/mm ²	5 W/mm ²	5 W/mm ²	5 W/mm ²
CS90	N/A	N/A	N/A	N/A	N/A	N/A
LS2	N/A	2.5 W/mm ²	5 W/mm ²	2.5 W/mm ²	2.5 W/mm ²	2.5 W/mm ²
LS3	N/A	2.5 W/mm ²	5 W/mm ²	2.5 W/mm ²	2.5 W/mm ²	2.5 W/mm ²
LS6	N/A	2.5 W/mm ²	5 W/mm ²	2.5 W/mm ²	2.5 W/mm ²	2.5 W/mm ²
QCS45	N/A	5 W/mm ²	10 W/mm ²	5 W/mm ²	5 W/mm ²	5 W/mm ²
UHS1	N/A	2.5 W/mm ²	5 W/mm ²	2.5 W/mm ²	2.5 W/mm ²	2.5 W/mm ²
VS14	N/A	5 W/mm ²	10 W/mm ²	5 W/mm ²	10 W/mm ²	5 W/mm ²
VS25	N/A	5 W/mm ²	10 W/mm ²	5 W/mm ²	5 W/mm ²	5 W/mm ²
VS35	N/A	5 W/mm ²	10 W/mm ²	5 W/mm ²	5 W/mm ²	5 W/mm ²
XRS14	N/A	N/A	N/A	N/A	N/A	N/A
XRS25	N/A	N/A	N/A	N/A	N/A	N/A
XRS6	N/A	N/A	N/A	N/A	N/A	N/A

The power density specification is not available for either the standard black TEFLON® or the polished stainless steel shutter blades. Due to the thermal characteristics of the blade material, and its relationship to the shutter mechanism, the maximum blade surface temperature should not exceed 200°C.

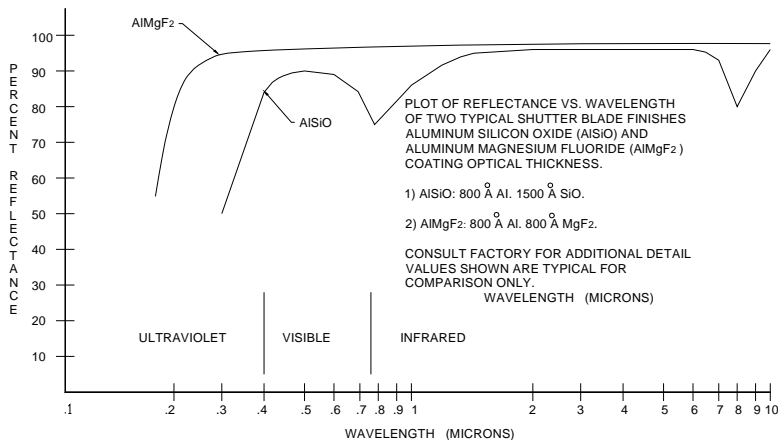


Figure 2

A reflectance vs. wavelength graph is provided to the left. All blade coatings are reflective on the input side only. **Be advised the reflective surface is intended for direct exposure to the user's laser or light source.** The opposing side is finished with black TEFLON®.

***When switching a high powered coherent or non-coherent light source with a shutter equipped with the proper coated blade for the particular application, input to the black TEFLON® side will most likely cause irreparable damage to the shutter's blades. This damage is not covered under our limited warranty. All listed power ratings are for input to the reflective side only.**

GENERAL SPECIFICATIONS:

The following provides additional information on the Electronic Synchronization System, Cable/Adapter/Connector Layout, and our Manufacturer's Warranty.

ELECTRONIC SYNCHRONIZATION SYSTEM

The Electronic Synchronization System provides a feedback signal after the shutter transfers to the open state. The system incorporates an infrared emitting diode, an infrared sensitive detecting transistor, and an interrupting vane. The vane is attached to the shutter so as to block the light path between the emitter and detector in the closed position. When the shutter transfers to the 80% open position, the vane is removed from the infrared light path, allowing the emitter to switch the detector to the active state. See Figure #3 for the CS25 and CS35 schematic with the Electronic Synchronization system. See Figure #4 for the QCS45 schematic with the Electronic Synchronization system. See Figure #5 for the CS25/CS35/QCS45 schematic without the Electronic Synchronization. See figure #6 for the schematic of all other shutter models (except CS90) with Electronic Synchronization. See Figure #7 for the schematic of all other shutter models (except CS90) without Electronic Synchronization. Support circuitry for the Electronic Synchronization System is built into the VCM and VMM type drive equipment. See the Timing section's Figure 1 for typical synchronization output waveform in the [timing](#) specifications.

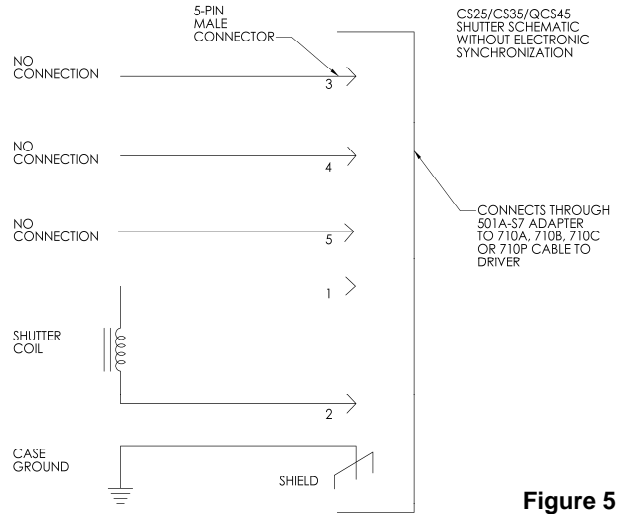


Figure 5

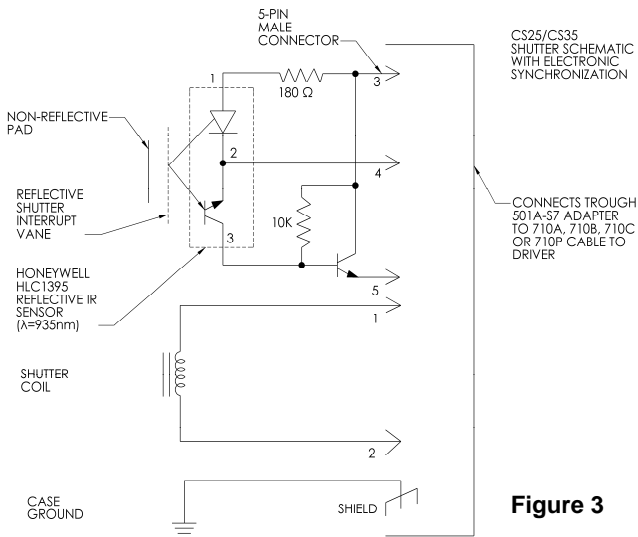


Figure 3

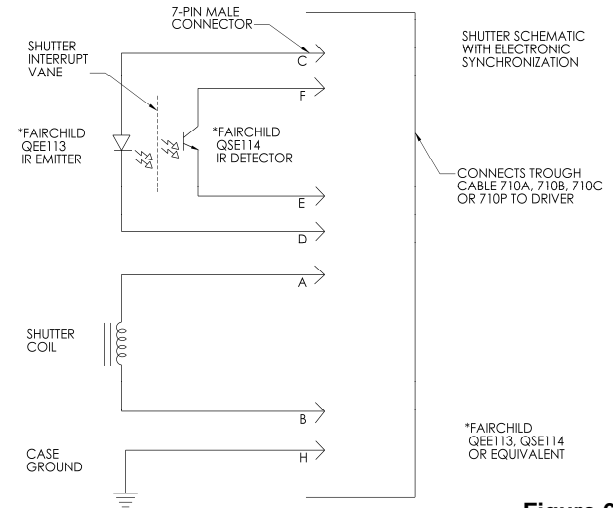


Figure 6

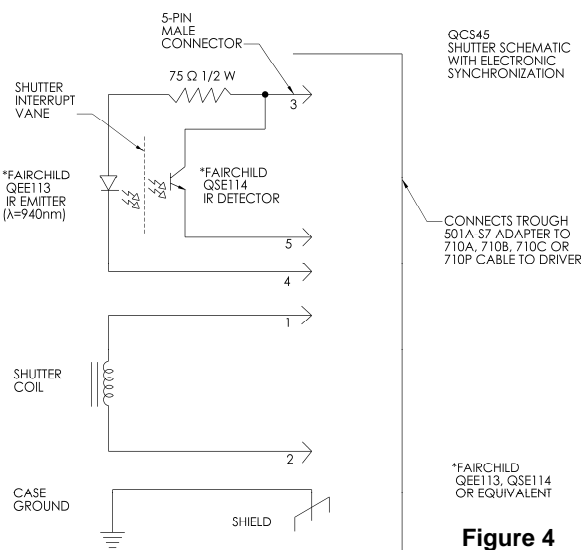


Figure 4

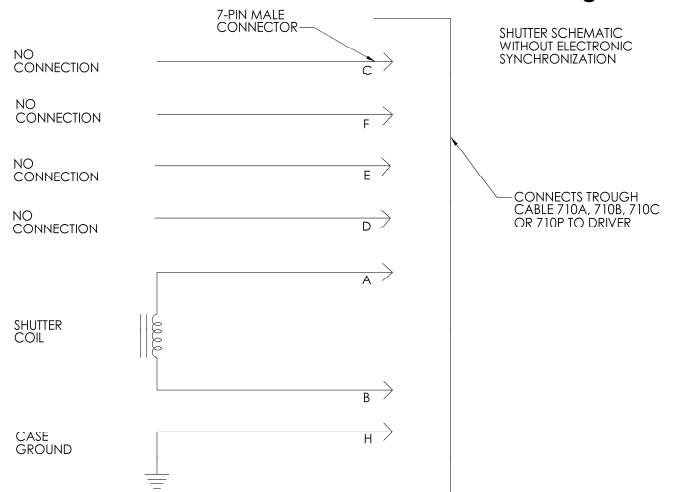


Figure 7

CABLE/ADAPTER/CONNECTOR LAYOUT

SHUTTER INTERCONNECTING CABLE TYPES:

710P Cable - 7-pin WirePro in-line female connector to 7-wire flying leads, 10ft. length. Supplied with D880C OEM driver or can also be purchased separately for use with 122-BP OEM driver.

710C Cable - 7-pin WirePro in-line female connector to 7-pin WirePro in-line male connector. 10ft.length. Presently supplied with VMM-D3, VMM-D4 OR VMM-T1 drivers. 710A will replace the 710C at a future date. (701CR Adapter may be required at that time.) The 710C can be purchased separately.

710B Cable - (7-pin WirePro in-line female connector to 7-pin ODU push-lock in-line male connector. Length is (3) meters. Presently supplied with the VCM-D1 driver. The 710A will replace the 710B at a future date. (701CR Adapter may be required at that time.) The 710B can be purchased separately.

710A Cable - 7-pin WirePro in-line female connector to 5-pin SWITCHCRAFT locking in-line male connector. Length is (3) meters. The 710A will replace the 710C and the 710B at a future date. The 710A can be purchased separately.

SHUTTER INTERCONNECTING ADAPTER TYPES:

501A-S7 Adapter - 5-pin SWITCHCRAFT locking in-line female connector to WIREPRO 7-pin in-line male connector. Length is (8) inches. Supplied with CS25, CS35 and QCS45 shutters which are equipped with 5-pin male connectors.

701CR Adapter - 7-pin WirePro in-line female connector to 7-pin WirePro in-line male connector. Length is (8) inches. Used if an older shutter with a 7-pin male connector and electronic synchronization is used with a newer type controller and the controller is supplied with a 710A interconnect cable. The 701CR adapter has a resistor installed in the female connector to bias the electronic sync emitter. Without this adapter the electronic sync will not function when using the 710A cable.

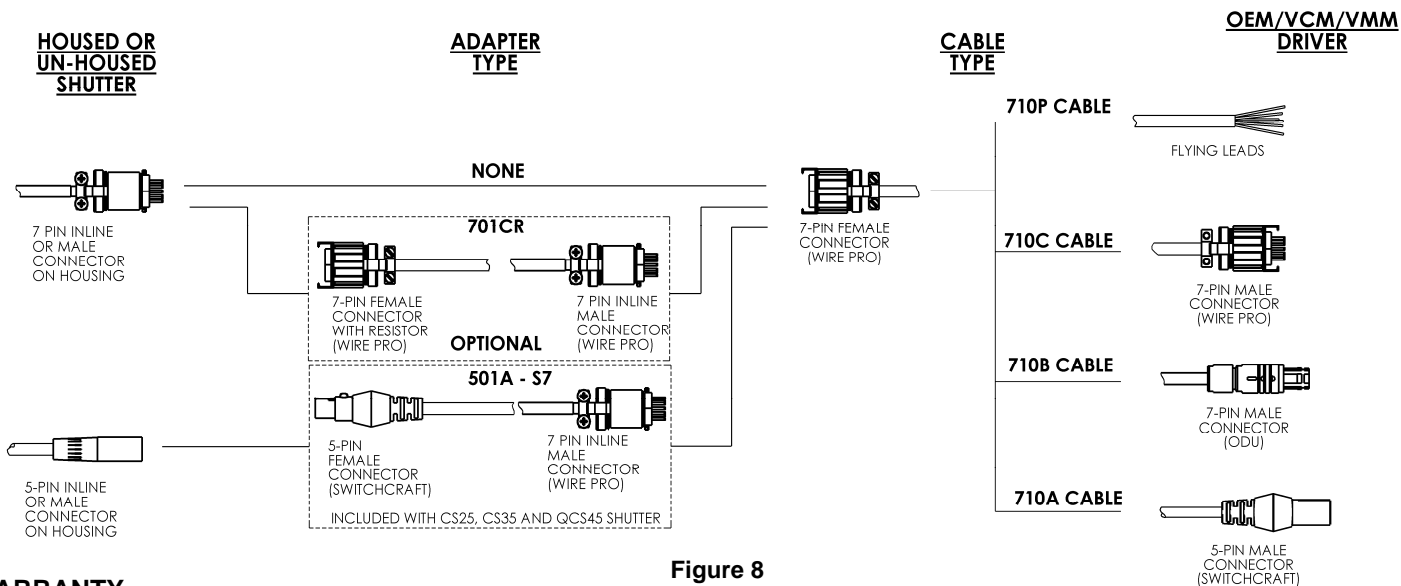


Figure 8

WARRANTY

All products manufactured by VINCENT ASSOCIATES are warranted to meet published specifications and to be free of defects in materials and workmanship as defined in the specifications for 365 (one year) days from the date of original shipment. MANUFACTURER will, at its own option, repair or replace without charge any listed item discovered to be defective. Burned out or otherwise damaged actuator coils are not covered under this warranty.

The buyer's exclusive remedy and the limit of MANUFACTURER'S liability for any loss whatsoever shall not exceed the purchase price paid by the buyer for the goods to which a claim is made. MANUFACTURER does not give any implied warranties of merchantability, fitness for a particular

purpose, or of any other nature in connection with the sale of any products.

The MANUFACTURER will consider the return of unused equipment if returned within 30 days from the original date of shipment, subject to a 20% restocking charge. This offer does not apply to used or damaged equipment. This warranty extends only to the original purchase and is not available to any third party, including any purchaser assemblies or other products of which the goods may become component equipment.

This warranty does not extend to cover damage resulting from alteration, misuse, negligence, abuse, normal wear and tear, or accident.