Submittal Data Information

301-2692

TRV – Taco Reduced Voltage Advanced Starter

EFFECTIVE: NOVEMBER 3, 2014 SUPERSEDES: NEW

JOB _____ ENGINEER _____

CONTRACTOR _____ REP. _____

ITEM NO. _____

TRV - TACO REDUCED VOLTAGE ADVANCED STARTER

3Ø, 208-575V, 5-300HP
HOA Keypad with LCD Display
BACnet Comms, Power Metering, Reduced Voltage Starting

STANDARD FEATURES FOR TACO ADVANCED SOFT-STARTER

Soft Start
• Energy savings through reduced inrush current
• Adjustable current limit, initial voltage, start/stop time
• Coast to stop
• Torque boost
• SCR over-temperature detection
• Shorted SCR detection
• Across-the-line start for emergency situations
Superior pump protection
• Class 5-30 Electronic Overload
• Phase loss/unbalance protection
• Stall/locked rotor condition
• Cycle fault
• Underpower (Protects the pump in a dry run condition)
HOA keypad with LCD display
• Plain English operation – easy to set up and simple to operate
• LEDs indicate Hand/Off/Auto modes, run and fault conditions

Built-in power monitoring, fault logging and communications
• 1% ANSI grade metering
• kW and kWh data available on LCD display
• Last 15 fault types are recorded (e.g. underpower, overload, voltage/current loss/unbalance, etc.)
• Fault counter: stores how many times each fault type has occurred (Up to 255)
• Logs changes to parameter settings (e.g. overload, OV/UV, underpower)
• All power condition values are displayed
• Built-in RS-485 for Modbus RTU communication

Building automation system ready
• Relay outputs for fault and proof of flow verification
• Detects dry pump and alerts automation system
• Eliminates costly current sensors
• Voltage input for auto run signal (accepts 12-120VAC/DC)
•Wire directly from the automation system to the starter, no interposing relays necessary
• Emergency shutdown initiates smoke purge sequence during emergency situations for safety and code compliance
• Dry inputs for auto run, emergency shutdown, and permissive auto (N.O. dry contact closure)
Optional circuit breaker disconnect
•Molded case circuit breaker provides branch and short circuit protection
• High interrupting ratings for maximum electrical system compatibility
• No fuses required
• Lockable handle for safety

Multi-tap control power transformer (CPT)
•Multi-tap CPT input accepts all common motor voltages
• Integrated secondary protection – no fuses required

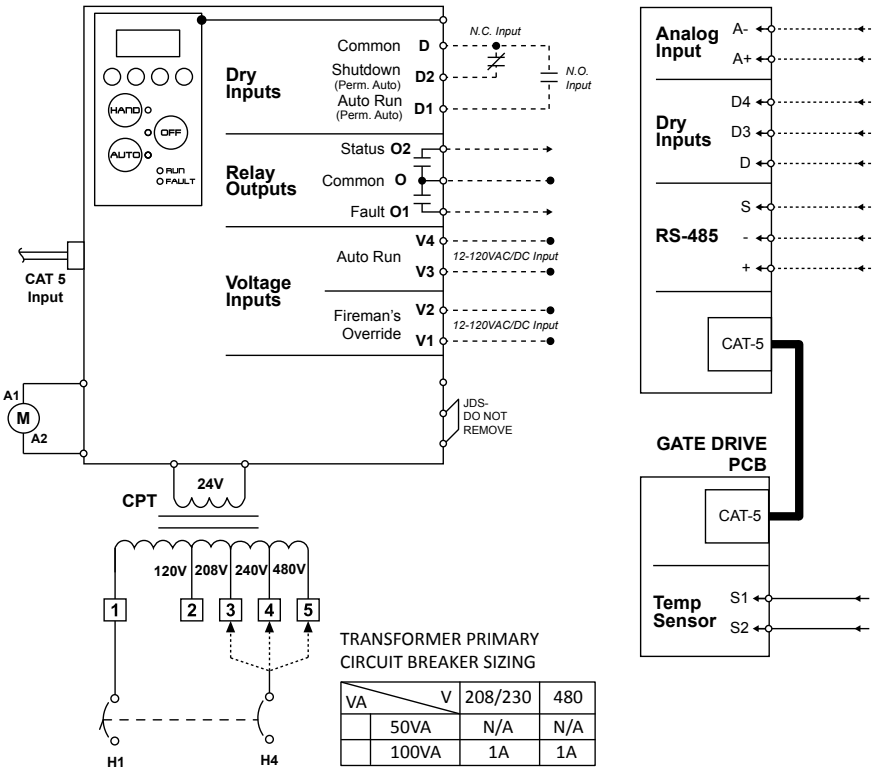
TRV SPECIFICATIONS

Starter Type		
TAS-RV - Taco Advanced Starter - Reduced Voltage (Soft Starter)		
200-600VAC, 3-Phase, 50/60Hz input, Reduced voltage starter		
NEMA Type 3R Enclosed		
User Interface		
Hand-Off-Auto		Door mounted Hand-Off-Auto keypad (water-tight-membrane)
Programming		Internal display with programming keys (LCD, back-lit, 16 character)
Mode Indication		Integrated LEDs, Hand-Off-Auto-Run-Fault indication
Standard Control Operations		
Inputs	Voltage Auto-Run	Accepts 12-130VAC/DC. Applying voltage will send a run command to the starter when in Auto mode.
	Dry Contact Auto-Run	Normally Open dry contact. When closed, the starter will be commanded to run when in Auto mode.
	Float Switches	2) Programmable Normally Open or Normally Closed dry contacts.
	Shutdown	Normally Closed dry contact. When open, the contactor will open and the starter will disengage the contactor and will not accept a run command with the exception of Fireman's Override. Hand/Off/Auto LEDs will flash.
	Permissive Auto	Normally Open dry contact. When closed, the starter will not accept a run command when in Auto mode.
	RS-485	Modbus RTU slave
	Analog Input	Selectable 0-10V, 4-20mAm 10k Thermistor, viewable as a Modbus point
Outputs	Status Relay	Normally Open relay contacts. Status Relay will close when the motor draws a user defined percentage of the FLA setting. Fault Relay will close in the event of a fault trip. Contact Ratings: 0.3A @ 125VAC, 1A @ 24VAC
	Fault Relay	
Operational	Starts	6/hour, 20 seconds max start time @ 400% FLA, 30 seconds max start time @ 300@ FLA
	Overload Type	Electronic, I^2t trip curve
	Power Fail Modes	Restart in last mode (Hand/Off/Auto) with no delay (default)
		Restart in Off mode
		Restart in Off mode if power failure lasts longer than 2 seconds. Restart in last mode if power failure is less than 2 seconds.
	On/Off Time Delay	On/Off, Adjustable: 0.1-99 seconds
	Fault Reset	Adjustable: Manual or Automatic
Environmental		
Ambient Operating Temp		-5° to 140° F (-20° to 60° C)
Ambient Storage Temp		-5° to 185° F (-20° to 85° C)
Relative Humidity		5% to 95% non-condensing

Motor / Soft Starter Protection	**Adjustment / Description**	**Default Setting**
Overload Current Setting Range	Differs per model	Per FLA
Overload Trip Class	Adjustable: 5-30	10
Overload Service Factor	Adjustable: 0.00-2.00	1.15
Under Power	On/Off, Adjustable: 0-99% of measured electrical input	Off / 60%
Over Power	On/Off, Adjustable: 101-200% of measured electrical input	Off / 120%
Over / Under Voltage	On/Off, Adjustable: ±5-25% over/under the nominal voltage setting	On / 10%
Voltage Phase Unbalance	On/Off, Adjustable: 1-20% voltage phase deviation	On / 3%
Voltage Phase Loss	Always On, Adjustable: 1-50% voltage phase deviation	5%
Voltage Phase Sequence Reversal	On/Off, Trips within 0.1 seconds upon voltage phase reversal detection	On
Ground Fault (Optional)	On/Off, Adjustable: 1.0-9.9A	Off / 1A
Cycle Fault	On/Off, Trips if contactor cycle rate exceeds 20 starts/minute	On
Warm Start Provision	On/Off, Delays motor restart after a fault trip, based on calculated motor temperature	On
Current Phase Unbalance	On/Off, Adjustable: 1-50% current phase unbalance	On / 20%
Locked Rotor / Stall	On/Off, Trips within 0.5 seconds	On
Shorted SCR	Always On, Trips upon detection of a shorted SCR or no motor	On
Open SCR	Always On, Trips if no current is detected during startup or bypass	On
SCR Over-Temperature	Always On, Trips if any SCR reaches 125°C	On
Across-The-Line Start	On/Off, Allows the user to start the motor across-the-line	Off

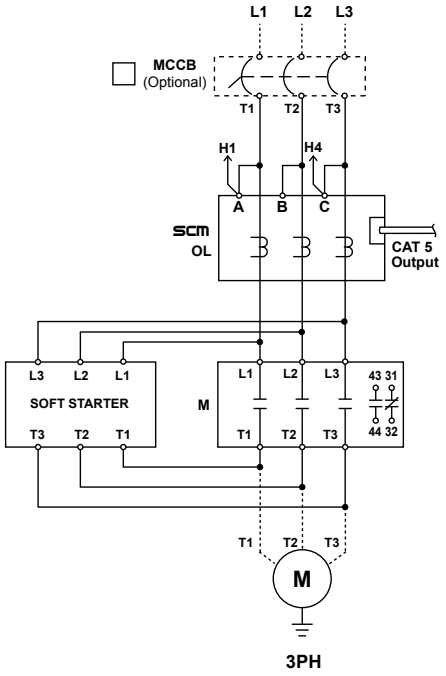
TRV WIRING DIAGRAM

**For part specific schematics contact manufacturer*



TRANSFORMER PRIMARY CIRCUIT BREAKER SIZING

VA \ V	208/230	480
50VA	N/A	N/A
100VA	1A	1A



NOTE: DASHED LINES INDICATE FIELD WIRING

3-POLE CONTACTOR SPECIFICATIONS

Frame size				22AF		40AF	
Type				MRC-9B	MRC-18B	MRC-32A	MRC-50LA
Terminal Type				Screw		Screw	
Number of poles				3 pole		3 pole	
Rated operation voltage, Ue				690V		690V	
Rated insulation voltage, Ui				690V		1000V	
Rated frequency				50/60Hz		50/60Hz	
Rated impulse withstand voltage, Uimp				6kV		8kV	
Max. operating rate in operating cycles per hour (AC3)				1800 operations per hour		1800 operations per hour	
Durability	Mechanical			15 mil. operations		12 mil. operations	
	Electrical			2.5 mil. operations		2 mil. operations	
Current and power	AC-1, Thermal current		A	25	40	50	70
	AC-3	200/240V	kW A	2.5 11	4.5 18	7.5 32	15 55
		380/440V	kW A	4 9	7.5 18a	15 32	22 50
		500/550V	kW A	4 7	7.5 13	18.5 28	30 43
		690V	kW A	4 6	7.5 9	18.5 20	30 28
UL rating (50/60Hz)	Continuous current		A	25	40	50	70
	Single Phase	110~120V	HP	0.5	1	2	3
		220~240V	HP	1.5	3	5	10
	Three Phase	200~208V	HP	2	5	7.5	20
		220~240V	HP	3	7.5	10	25
		440~480V	HP	5	10	20	40
		550~600V	HP	7.5	15	25	50
	NEMA size			00	0	1	2
Size and weight	MRC	Weight Size (WxHxD)	lbs in	0.73 lbs 1.77 x 2.89 x 3.39 in		0.88 lbs 1.77 x 3.27 x 3.54 in	1.98 lbs 2.17 x 4.17 x 4.69 in
	MRD	Weight Size (WxHxD)	lbs in	1.12 lbs 1.77 x 2.89 x 4.63 in		1.32 lbs 1.77 x 3.27 x 4.61 in	2.65 lbs 2.17 x 4.17 x 5.76 in
Auxiliary (standard)				1NO & 1NC		1NO & 1NC	
Auxiliary	Side mount			MA-1		MA-1	
	Front mount			CA-2, CA-4		CA-2, CA-4	

**Minimum conduct current of auxiliary contactor is DC 17V 5mA*
***10A max, Not motor duty rated.*

SUBMITTED EQUIPMENT SCHEDULE

QTY	TAG	TRV PART#	NEMA SIZE	HP	VOLTAGE	PHASE

150AF	
MRC-85LA	MRC-150LA
Lug	
3 pole	
690V	
1000V	
50/60Hz	
6kV	8kV
1800 operations per hour	
12 mil. operations	5 mil. operations
2 mil. operations	1 mil. operations
135	210
25 85	45 150
45 85	75 150
45 75	70 100
45 45	50 60
135	210
7.5	15
15	25
30	40
40	50
60	100
75	75
3	4
3.53 lbs 2.76 x 5.51 x 5.35 in	5.29 lbs 0.15 x 0.24 x 0.20 in
5.73 lbs 2.76 x 5.51 x 6.78 in	
1NO & 1NC	
MA-1	
CA-2, CA-4	

400AF	
MRC-330A	MRC-400A
Screw	
3 pole	
690V	
1000V	
50/60Hz	
8kV	
1200 operations per hour	
5 mil. operations	2.5 mil. operations
1 mil. operations	0.5 mil. operations
350	450
90 330	125 400
160 330	225 350
160 280	225 350
200 225	250 300
350	450
-	-
-	-
100	125
125	150
250	300
250	300
5	-
20.28 lbs 6.42 x 9.57 x 8.05 in	
2NO & 2NC	
CA-100	

MOLDED CASE CIRCUIT BREAKERS SPECIFICATIONS

TD/TS series circuit breakers have built in thermal-magnetic trip units. Some models of the TD/TS series circuit breakers are UL Listed to be applied at up to 100% of their current rating. Because of enclosures and 90°C rated wire are required when using circuit breakers at 100% of their current rating.

Markings on the circuit breaker indicate the minimum enclosure size and ventilation requirements. The 90°C wire size shall be based on UL 489. Circuit breakers with 100% rating can also be used in applications requiring only 80% continuous loading.

TD/TS Series		TD125	
Frame size		125AF	
Rated current In	A	15, 20, 30, 40, 50, 60, 80, 100, 125	
Number of poles		3	
Rated operational voltage, Ue AC	V	600	
UL interupting rating	kA	**NU**	**HU**
AC 50/60Hz	120V	50	100
	240V	50	100
	480V	35	65
	600V	10	14
Reference standard		UL 489	
Available breaker types		Fixed thermal, fixed magnetic	FTU
		Adjustable-thermal, fixed-magnetic	FMU
Accessories		-	
		AX - Auxiliary switch	
		AL - Alarm switch	
		SHT - Shunt trip	
		UVT - Undervoltage trip	
		EHU - Extended rotary handle	
		FH - Flange handle	
		PL, PHL - Locking devices (Removable, fixed)	
		MIT - Mechanical interlock device	
Mechanical life	Operations	4,000	
Electrical life @600V AC	Operations	4,000	
Weight 3-pole lbs (kg)		2.65lbs (1.2kg)	
Basic dimension, Wx Hx D 3-Pole in (mm)		3.54 x 6.46 x 3.39in (90 x 164 x 86mm)	

TS250		TS400		TS800	
250AF		400AF		800AF	
150, 175, 200, 250		300, 400		500, 600, 800	
3		3		3	
600		600		600	
NU	**HU**	**NU**	**HU**	**NU**	**HU**
-	-	-	-	-	-
50	100	50	100	50	100
35	65	35	65	35	65
10	18	14	20	18	25
UL489					
Fixed thermal, fixed magnetic, FTU		Fixed thermal, fixed magnetic, FTU		Fixed thermal, fixed magnetic, FTU	
Adjustable-thermal, fixed-magnetic, FMU		Adjustable-thermal, fixed-magnetic, FMU		Adjustable-thermal, fixed-magnetic, FMU	
Adjustable-thermal, Adjustable-magnetic (3 pole), ATU		Adjustable-thermal, Adjustable-magnetic (3 pole), ATU		Adjustable-thermal, Adjustable-magnetic (3 pole), ATU	
AX - Auxiliary switch		AX - Auxiliary switch		AX - Auxiliary switch	
AL - Alarm switch		AL - Alarm switch		AL - Alarm switch	
SHT - Shunt trip		SHT - Shunt trip		SHT - Shunt trip	
UVT - Undervoltage trip		UVT - Undervoltage trip		UVT - Undervoltage trip	
EHU - Extended rotary handle		EHU - Extended rotary handle		EHU - Extended rotary handle	
FH - Flange handle		FH - Flange handle		FH - Flange handle	
PL, PHL - Locking devices (removable, fixed)		PL, PHL - Locking devices (removable, fixed)		PL, PHL - Locking devices (removable, fixed)	
MIT - Mechanical interlock device		MIT - Mechanical interlock device		MIT - Mechanical interlock device	
5,000		5,000		3,000	
1,000		1,000		500	
4.19lbs (1.9kg)		12.57lbs (5.7kg)		29.98lbs (13.6kg)	
4.13 x 7.01 x 3.39in (105 x 178 x 86mm)		5.51 x 11.50 x 4.33in (140 x 292 x 110mm)		8.27 x 16.85 x 5.31in (210 x 428 x 135mm)	

DIMENSIONS

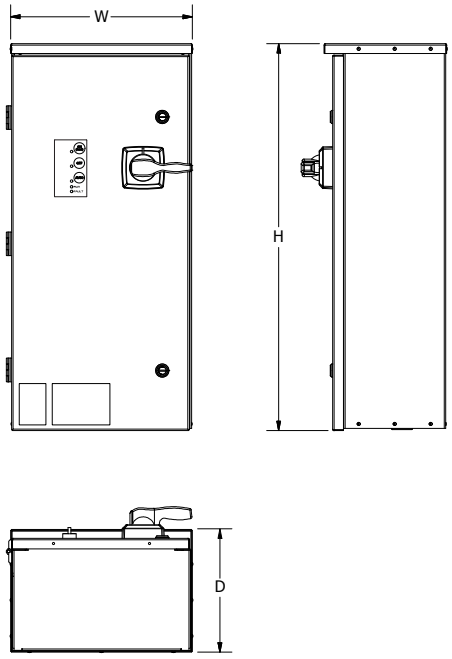
**All measurements in inches*

TAS-RV (Combination)

Starter Size	H	W	D
TAS3RRV9JG15 ~ TAS3RRV100JG150	32	15	10
TAS3RRV150JGXXX	36	24	12
TAS3RRV330JG250 ~ TAS3RRV330JG400	42	30	12
TAS3RRV330JG500 ~ TAS3RRV400JG600	48	30	16

TAS-RV (Standard)

Starter Size	H	W	D
TAS3RRV50J ~ TAS3RRV100J	32	15	10
TAS3RRV150J	36	24	12
TAS3RRV400J	42	30	12



Do your **best work.®**

TACO INC., 1160 Cranston Street, Cranston, RI 02920 Telephone: (401) 942-8000 Fax: 942-2360
TACO (Canada), Ltd., 8450 Lawson Road, Unit #3, Milton, Ontario L9T 0J8 Telephone: 905/564-9422 Fax: 905/564-9436
Visit our website at: www.taco-hvac.com

Printed in USA