

# Replacement of Traditional Fisher™ easy-e™ Trim with Trim Cartridge

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## Management of Change

Management of Change (MOC) is a procedure used to proactively manage changes that have the potential to impact safety or processes within a plant. Evaluating new techniques for improving MOC approval procedures can have an impact on plant efficiency. Historically, upgrading obsolete products or replacing existing process control equipment had been delayed or abandoned due to the extensive paperwork involved in completing a complex MOC approval sheet.

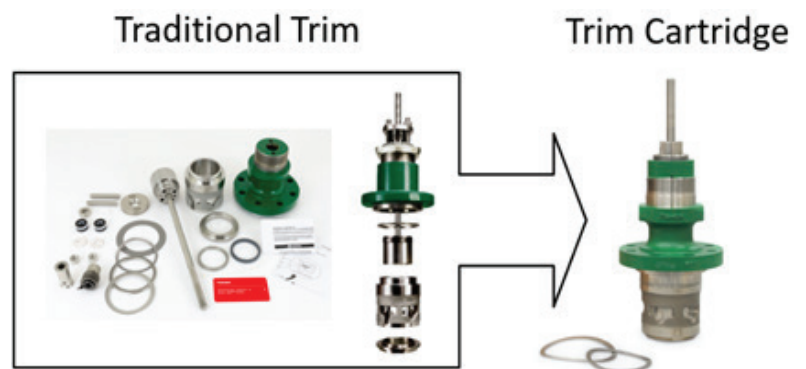
Contained in this Management of Change document are design comparisons between traditional easy-e trim and the easy-e Trim Cartridge. Traditional easy-e trim will be referenced as “traditional trim” throughout this document; the easy-e Trim Cartridge will be referenced as “Trim Cartridge.” These comparisons are intended to help end-users understand the similarities and differences between traditional trim and the Trim Cartridge in order to complete MOC approval documents for an efficient and safe transition.

## Background

Traditional trim is available for easy-e control valves with a variety of characteristics, material offerings, and sizes. When a valve requires trim repair, the Emerson sales office provides the user a RSPPL, or recommended spare parts list for the valve. Depending on the extent of the repair as determined in the discovery process, all or a portion of the RSPPL is ordered. The valve bonnet and trim are then removed, the more than 20 trim parts are disassembled, damaged parts are replaced, and the trim is then reassembled and installed. Traditional trim parts have been the solution to maintain and extend the life of easy-e control valves for over 60 years. In addition to traditional trim parts, Trim Cartridge is now available as a new repair solution that simplifies valve repair procurement, inventory, and installation.

Trim Cartridge is a complete control valve repair solution that incorporates a full RSPPL replacement plus a new bonnet in a single, factory assembled repair cartridge. Its pre-assembled design with factory set packing and factory seat leak testing allows for simplified installation that reduces trim repair time and complexity. Trim Cartridge offers the same fit and function of traditional easy-e trim, but is ordered as a single part number simplifying parts procurement and inventory management.

Trim Cartridge is available for the easy-e ET and EZ valves, NPS 1 through 4. In addition to being a repair solution, Trim Cartridge is also offered as a trim option in new valve assemblies.



## Question and Answer Checklist

- 1**    **Q:** Does the proposed modification cause any changes to the piping and instrumentation diagram (P&ID)?  
**A:** No.
- 2**    **Q:** Does the proposed modification change process chemistry, technology, or operating and control philosophies?  
**A:** No.
- 3**    **Q:** Does the proposed modification change how the existing plant is operated?  
**A:** No.
- 4**    **Q:** Does the proposed modification change process flows?  
**A:** No.
- 5**    **Q:** Does the proposed modification change existing pressure relief cases?  
**A:** No.
- 6**    **Q:** Does the proposed modification change the process description?  
**A:** No.
- 7**    **Q:** Have the codes and standards to which the new equipment was designed changed?  
**A:** No.
- 8**    **Q:** Does the proposed modification change the materials of construction, such as a change in material form (cast, forged, or alloy)?  
**A:** No.
- 9**    **Q:** Does the proposed modification introduce new equipment items that require periodic predictive maintenance?  
**A:** No.

**10 Q:** Does the proposed modification change existing operator training requirements?

**A:** No.

**11 Q:** Does the proposed modification introduce new equipment items that require spare parts, training manuals, maintenance procedures, or training to teach the maintenance department how to maintain them?

**A:** Yes. Trim Cartridge packing adjustment differs from traditional trim. See Fisher ET and EZ easy-e Valves with Trim Cartridge Instruction Manual D104358X012.

**12 Q:** Does the proposed modification permanently remove the spares for existing pieces of equipment?

**A:** Possibly. Refer to chart below.

		<b>Repair Type</b>	
		Traditional Trim	Trim Cartridge
<b>Current Trim Type</b>	Traditional Trim	No change to RSPPL	New Trim Cartridge part number required
	Trim Cartridge	New bonnet required in addition to valve RSPPL	Replacement Trim Cartridge only

**13 Q:** Does the proposed modification require welding work to be performed?

**A:** No.

**14 Q:** Does the proposed modification change the inspection scope or inspection interval?

**A:** No.

## Traditional Trim and Trim Cartridge

The following information is intended to provide a general comparison between traditional trim and Trim Cartridge.

### Capacities (Cv)

Fisher easy-e control valves with Trim Cartridge have equivalent flow characteristics to traditional trim.

### Trim Number Designations

ET Trim Number Designations			
Traditional Trim Designation	Trim Cartridge Trim Designation	Valve Plug	Cage & Seat Material
1	1TC Trim Cartridge	416 SST HT	17-4 SST HT
27	27TC Trim Cartridge	316 SST w/CoCr-A seat & guide	316 SST Chrome Plate/HF Seat
29	29TC Trim Cartridge	316 SST	318 SST Chrome Plate
85	85TC Trim Cartridge	316 SST	316 SST Chrome Plate
87	87TC Trim Cartridge	316 SST w/CoCr-A seat & guide	316 Chrome Plate/HF Seat

EZ Trim Number Designations					
Traditional Trim Designation	Trim Cartridge Trim Designation	Valve Plug	Seat Ring	Seat Ring Retainer	Guide Bushing
101	101TC Trim Cartridge	416 SST HT	416 SST HT	17-4 SST HT	17-4 SST HT
127	127TC Trim Cartridge	316 SST w/CoCr-A seat & guide	Alloy 6	316 SST	Alloy 6
129	129TC Trim Cartridge	316 SST	316 SST	316 SST	Alloy 6
85	85TC Trim Cartridge	316 SST	316 SST	316 SST	Alloy 6
87	87TC Trim Cartridge	316 SST w/CoCr-A seat & guide	Alloy 6	316 SST	Alloy 6

## Actuator Bench Set and Sizing

The standard packing selection in traditional trim is single PTFE. The standard packing selection for Trim Cartridge is low emission ENVIRO-SEAL PTFE. If the packing type is changing during the valve repair, it is recommended to perform an actuator sizing check and validate the bench set calculation of the new packing friction. If the Trim Cartridge is replacing traditional trim that used a composition (soft) seat, such as Trim 57C in the ET, then it is imperative to review actuator sizing and seat load requirements as Trim Cartridge is only offered in metal seat which requires higher seat load.

For valves to maintain current seat leakage shut-off class, the Trim Cartridge will meet Class IV shut-off with Class IV seat load. If the valve will be upgraded from Class IV or lower shut-off to Class V shut-off to take advantage of the Trim Cartridge's Class V capability, it is highly recommended to perform an actuator sizing check and properly account for the seat load requirements because of the difference between Class IV and Class V seat loads. For assistance with an actuator sizing review, consult your Emerson sales office for assistance.

## Packing Design and Replacement

Traditional trim utilizes packing studs and nuts whereas Trim Cartridge uses a single packing nut. This design difference also serves as the visual identifier of Trim Cartridge. Both traditional trim and Trim Cartridge allow for inline packing replacement. See Fisher ET and EZ easy-e Valves with Trim Cartridge Instruction Manual D104358X012 for instructions for Trim Cartridge packing replacement.

## Repairability

Traditional trim allows for disassembly of the trim and the repair of individual parts. Trim Cartridge must be replaced as a whole unit. Though individual metallic parts on the Trim Cartridge are not serviceable, the packing can be removed and replaced.

## Open and Inspect

Open and inspect is an appropriate maintenance procedure for traditional trim. Open and replace is the recommended maintenance procedure for Trim Cartridge. Once a used Trim Cartridge is uninstalled, it should not be re-installed and it cannot be reconditioned. It should be replaced with a new Trim Cartridge.



## Available Options

Valve Type	Sizes	Bonnet Materials	Characteristic	Stem Sizes	Trim #	Plug	ET Cage / EZ Retainer & Bushing	Seat	Stem
ET	NPS 1-4 Full & Reduced Ports	WCC LCC CF8M all NACE compliant	Equal Percent,  Linear	3/8" & 1/2" (NPS 1 & 1.5)	1TC Trim Cartridge	416 SST HT	17-4 SST HT	17-4 SST HT	316 SST
					27TC Trim Cartridge	316 SST w/ CoCr-A seat & guide	316 SST Chrome Plate	316 SST w/ CoCr-A HF Seat	316 SST
					29TC Trim Cartridge	316 SST	316 SST Chrome Plate	316 SST	316 SST
					85TC Trim Cartridge (NACE)	316 SST	316 SST Chrome Plate	316 SST	Nitronic 50
					87TC Trim Cartridge (NACE)	316 SST w/ CoCr-A seat & guide	316 SST Chrome Plate	Alloy 6	Nitronic 50
EZ	NPS 1-4 Full, Reduced, & Micro-Form Ports			1/2" (NPS 2, 3 & 4)	101TC Trim Cartridge	416 SST HT	17-4 SST HT	17-4 SST HT	316 SST
					127TC Trim Cartridge	316 SST w/ CoCr-A seat & guide	316 SST & Alloy 6	Alloy 6	316 SST
					129TC Trim Cartridge	316 SST	316 SST & Alloy 6	316 SST	316 SST
					85TC Trim Cartridge (NACE)	316 SST	316 SST & Alloy 6	316 SST	Nitronic 50
					87TC (NACE)	316 SST w/ CoCr-A seat & guide	316 SST & Alloy 6	Alloy 6	Nitronic 50

### Additional Options

The standard packing selection for Trim Cartridge is ENVIRO-SEAL PTFE. Other available packing options are ENVIRO-SEAL Graphite ULF, or ENVIRO-SEAL Duplex.

Modified-PTFE/R30003 spring-loaded seal ring with PEEK anti-extrusion rings for high temperature seal to 316C (600F) is available for ET Trim Cartridges

## Conclusion

Trim Cartridge is a new to market, hybrid repair solution for easy-e control valves that brings repair confidence to valve repair. It is a factory assembled repair cartridge that contains all valve recommended replacement parts plus the bonnet in a single, serialized part number and is offered as both a repair part and as an option available in new easy-e valve assemblies. Trim Cartridge brings price, schedule, and performance confidence to valve repair by simplifying repair procurement, inventory, and execution.





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**Emerson Automation Solutions**

Marshalltown, Iowa 50158 USA  
Sorocaba, 18087 Brazil  
Cernay, 68700 France  
Dubai, United Arab Emirates  
Singapore 128461 Singapore