

Consolidated™ 2900/3900 TM Series POSRVs Management of Change (MoC) Understanding Triple Media Certification

As a world leader in providing Safety and Safety Relief valve solutions, Baker Hughes offers multi-media pilot-operated valve designs for enhanced performance, capabilities and features within an economical, modular assembly.

The innovation of the Triple Media (TM) trim design makes the 2900 Series the first full nozzle design pilot-operated safety relief valve (POSRV) and the 3900 Series one of the first semi nozzle design POSRV in the industry that are "Triple-Certified", meeting multi-media certification as defined by API Standard 520 Part 1, 10th Edition – Sizing, and Selection. Triple-Certified is defined as pressure relief valves that are vapor/gas, liquid, and steam flow certified without making any modifications or adjustments to the relief device when switching fluids during capacity testing. The 2900/3900 TM trim is engineered to perform on liquid, gas, and steam media and has been qualified to meet multi-media nameplate capacity stamping per ASME B&PVC Code Case 2787. The 2900/3900 TM performs optimally on any single phase and is the ideal trim for 2-phase applications, and multiple relief case scenario providing reliable performance in any situation where the controlling relief case media differs from any other non-controlling overpressure relief case(s) media. There are significant performance improvements associated with Triple-Certified trim such as blowdown improvement, set point consistency, and overall valve stability. Table 1 provides additional details outlining the performance improvements of a Triple-Certified vs. a Double-Certified and Dual-Certified trim.



Double, Dual, or Triple Certified POSRV?

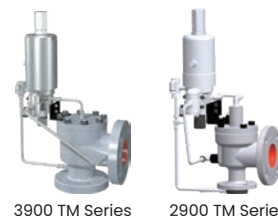


Table 1: Triple-Certified vs. Double-Certified and Dual-Certified Trim

Double, Dual, or Triple Certified POSRV?		Double Certified	Dual Certified	Triple Certified
Capacity Certification	National Board Capacity Certification for gas/steam & liquid	✓ POSRV that has two capacity certification: one for gas/steam and another for liquid	✓ POSRV that has two capacity certification: one for gas/liquid and another for steam	✓ Triple Media (TM) trim POSRV which is certified for gas, liquid, & steam on same certification
Triple Capacity Stamping	National Board Capacity Certification per ASME VIII CC 2787	✗ Majority of POSRV manufacturers can only list single capacity on nameplate	✗ Can only list two capacities on nameplate; just gas & liquid	✓ NB certifications 01427, 01438, 2900 & 3900 TM to ASME VIII CC 2787. Up to three capacities on nameplate
API 520 Compliance	Meet Dual Certified PRV definition in API 520 Part I, 10th Edition	✗ Do not meet Dual Certified PRV definition in API 520 Part I, 10th Edition	✓ Meets Dual Certified PRV definition in API 520 Part I, 10th Edition	✓ 2900/3900 TM is in 100% compliance with API 520 Part I, 10th Edition Dual Certified definition
Set Pressure⁽¹⁾	Must hold ASME set pressure tolerance between gas, liquid, & steam without any modifications or adjustments	✗ Part changes/ adjustments required in order to hold set pressure tolerance between gas/liquid & steam	— Part changes/ adjustments may be required in order to hold set pressure tolerance between gas/liquid & steam	✓ 2900/3900 TM holds set pressure tolerance between gas, liquid, & steam without trim part changes or adjustments
Blowdown Performance⁽¹⁾	Minimize blowdown for gas, liquid, & steam with the same valve & trim	✗ Blowdown range from 3% to 15% dependent on service	— Blowdown range may be dependent on service/design	✓ Blowdown ranging from 3% to 5% for gas, liquid, & steam

1. Design dependent.

Certification Process

It is important to note that traditional POSRVs will have two National Board certificates, one for liquid (incompressible fluids) and one for gas/vapor/steam (compressible fluids). The separation of each media traditionally requires its own National Board certification due to design requirements of unique trim sets to meet ASME requirements. Now with the latest Code Case 2787, the 2900/3900 TM each has a single National Board certificate which features vapor, liquid & steam media. There are no part changes or adjustments required for these valves to perform within ASME requirements for all media. The TM has two Kd values and both are listed on a single National Board certificate which is unique for a pilot-operated valve. The only scenario where the nameplate will show all three certified capacities is when steam is the governing case or it is part of a multi-sizing case scenario.

Model Number Change

With the evolution of the 2900/3900 series valves, the configuration code has been updated to reflect the new TM design. Figures 1 & 2 show the 2900/3900 TM series configuration code. There is now a designator for TM which denotes the 2900/3900 valve is being certified to comply with Code Case 2787. In addition to the new TM designator, the media-specific trim designations, LA, GS, & SS have been replaced with LADC, GSDC, & LATC, GSTC, SSTC. This designation shows which media was considered the governing case for sizing purposes. LADC/LATC means that the liquid relief scenario was the governing case, while GSDC/GSTC means that the gas relief scenario was the governing case & SSTC means that steam is governing case. When vapor or liquid cases are considered governing, the valve will be certified for both media and the nameplate will feature the relieving capacities for both liquid and gas relief scenarios (LADC, GSDC). When steam is the governing case or there is a non-governing steam relief scenario, the valve will be certified for all three media and the nameplate will feature relieving capacities of steam, liquid, gas relief scenarios (SSTC, LATC or GSTC).

Conversions and Part Changes

The standard 2900/3900 series valves feature the same parts as the newly released TM series valve lines. The only difference is the TM series will utilize the liquid modulator in all cases versus a standard 2900/3900 which has a media specific modulator. Additionally, the Thermodisc is not a selectable option for the TM series.

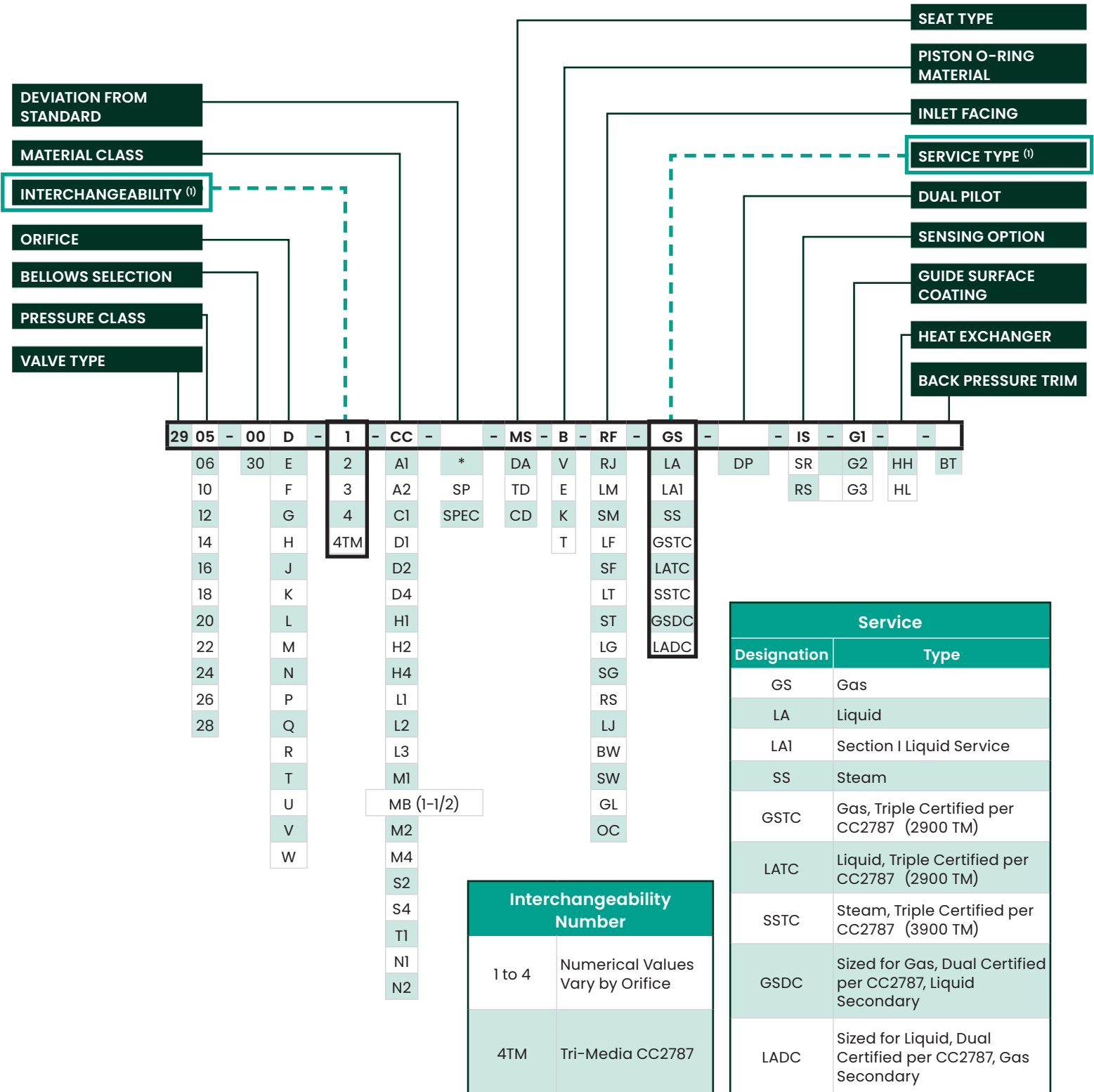
2900/3900 TM Nameplate Capacities

Table 2: Shows when the 2900/3900 TM will receive three nameplate capacities.

Governing Case's Fluid	Secondary/ Multi Case Fluid	Functional Test Required	Nameplate Capacities Listed			Dual/Triple Certified
			Air/Gas	Liquid	Steam	
Air/Gas	Air/Gas	Air/Gas	●	●		Dual
	Liquid	Air/Gas or Liquid	●	●		
	Liquid & Steam	Steam	●	●	●	Triple
	Steam	Steam	●	●	●	
Liquid	Air/Gas	Air/Gas or Liquid	●	●		Dual
	Air/Gas & Steam	Steam	●	●	●	Triple
	Liquid	Liquid	●	●		Dual
	Steam	Steam	●	●	●	Triple
Steam	Air/Gas	Steam	●	●	●	Triple
	Liquid	Steam	●	●	●	
	Steam	Steam	●	●	●	

Valve Configuration Code

2900/2900 TM Series Main Valve

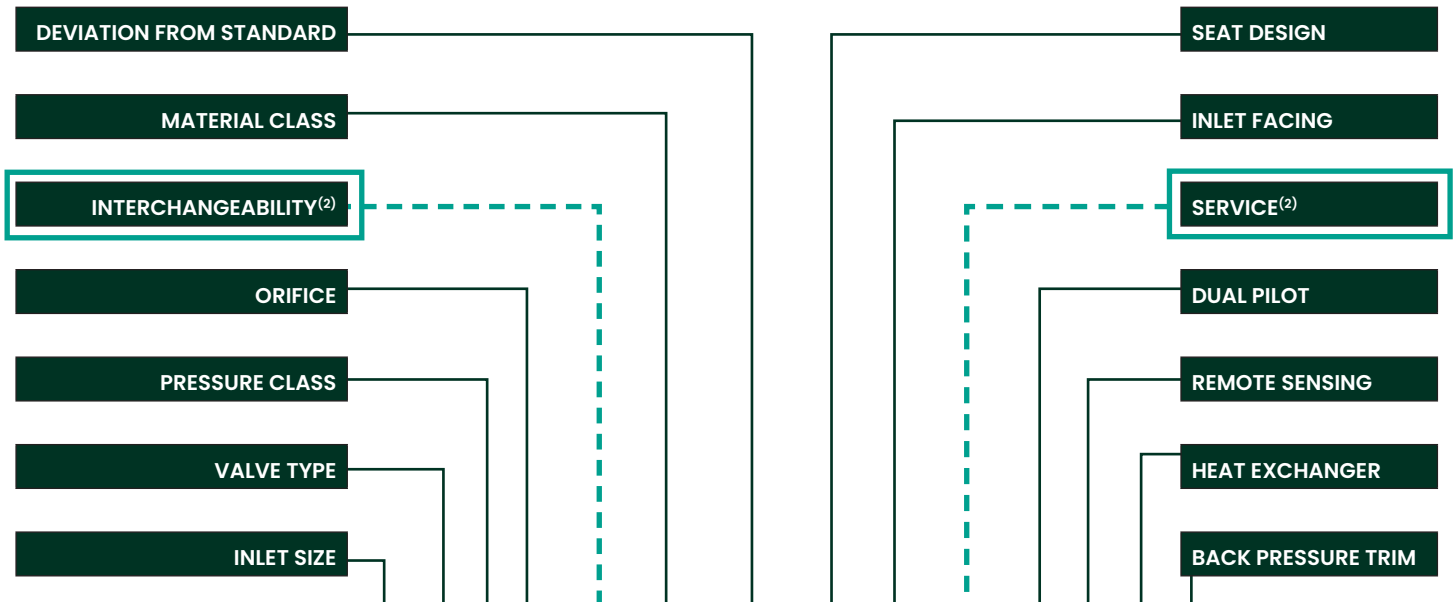


1. TM suffix code for TM certified valve only; applicable if a Triple Media (TM) is selected.

Figure 1: 2900/2900 TM Configuration Code

Valve Configuration Code

3900/3900 TM Series Main Valve



1	-	39	05	D	-	4	-	CC	-	-	-	MS	-	RF	-	GS	-	-	-	-	-	-
1.5		10	E	5		C1		*		DA	RJ	LA	DP	RS	HH	BT						
2		12	F	4TM		A4		SP		TD	LM	SS			HL							
3		14	G	5TM		D4		SPEC			SM	GSTC										
4		16	H			H4					LF	LSTC										
6		18	J			M4					SF	SSTC										
8		48	K			S4					LT	GSDC										
10 ⁽¹⁾		49	L			N1					ST	LADC										
12 ⁽¹⁾			M			N2					LG											
			N			N3					SG											
			P			N4					RS											
			Q			N5					GL											
			R			N6					TL											
			T			F51																
			B**			F53																
			XB**			F55																

Interchangeability	
Designation	Valve Type
4	All soft seated design except 3918K
5	All metal seat design and 3918K soft seat design
4TM	All soft seated design except 3918K, Triple Media-CC2787 (3900 TM)
5TM	All metal seat design and 3918K soft seat design, Triple Media-CC2787 (3900 TM)

Service	
Designation	Type
GS	Gas
LA	Liquid
SS	Steam
GSTC	Sized for Gas, Triple Certified per CC2787 (3900 TM)
LATC	Sized for Liquid, Triple Certified per CC2787 (3900 TM)
SSTC	Sized for Steam, Triple Certified per CC2787 (3900 TM)
GSDC	Sized for Gas, Dual Certified per CC2787, Liquid Secondary
LADC	Sized for Liquid, Dual Certified per CC2787, Gas Secondary

1. Denotes Full-Bore (FB) offering only
2. TM only; applicable if a Triple Media (TM) is selected.

Figure 2: 3900/3900 TM Configuration Code

Valve Configuration Code

Pilot Valve

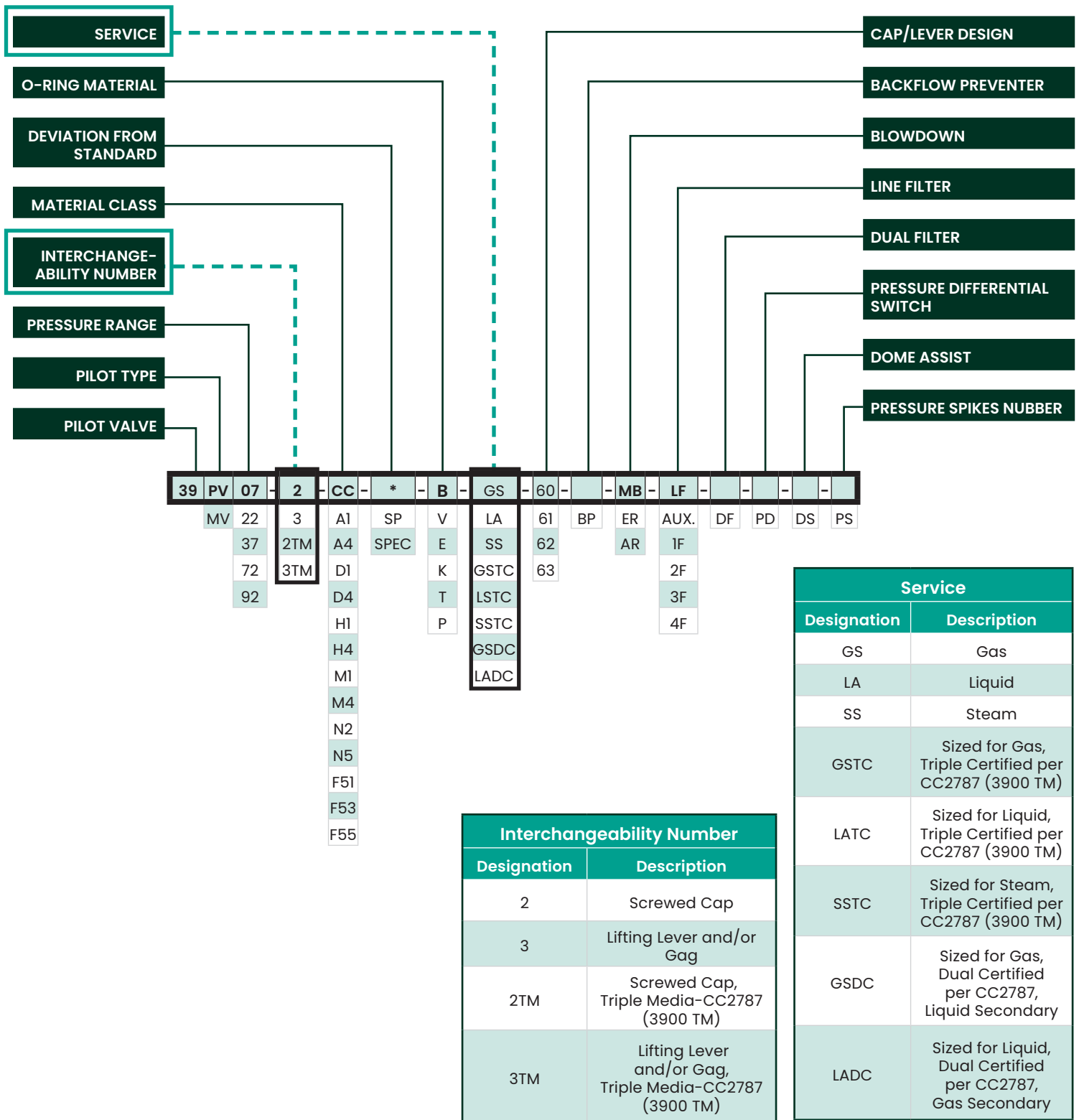


Figure 3: Pilot Valve Configuration Code

Frequently Asked Questions

1	Question	After getting TM certified, can a Baker Hughes channel partner provide a 2900/3900 TM with only one media stamping and utilize the previous model numbering (GS, LA, SS)?
	Answer	<p>No. The sample valves used for NB testing were configured to TM engineering guidelines and therefore must have an indicator to track these changes.</p> <ul style="list-style-type: none"> • TM valves use liquid modulators only for all media • TM valves use flat discs only for steam <p>New model coding was created to track these configuration differences. TM certification means you can only assemble 2900 TM or 3900 TM products. The model number must have the TM code.</p>
2	Question	Can existing 2900 and 3900 products be converted to TMs?
	Answer	Yes.
3	Question	Are there any centerline to face dimensional changes from 2900/3900 to the 2900/3900 TM?
	Answer	<p>No.</p> <ul style="list-style-type: none"> • The 2900/3900 TMs feature the same centerline to face dimensions as the standard 2900/3900 • The 2900 TM meets API 526 spring-loaded dimensions • The 3900 TM meets API 526 pilot-operated dimensions
4	Question	Are there any changes to the backpressure correction factors when switching from a standard 2900/3900 to a 2900/3900 TM?
	Answer	No. The latest back pressure enhancement applies to these product lines.
5	Question	Do the 2900/3900 TM meet API 520's definition of a multi-media certified pressure relief valve?
	Answer	Yes. The 2900/3900 TM meet the definition per API.

