

CTCS CONNECTION SYSTEM FAMILY OVERVIEW



• APTIV •

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CTCS Family Overview | Aptiv Confidential | July 2019

The Challenge

- Stringent emissions regulations
Harsh operating environments
- Alternative powertrains
Increased electrical architecture complexity
- More robust and reliable connection systems are needed

The Solution

Introducing the CTCS connection system family.
A versatile solution with designed in reliability and superior performance, for the transportation market and heavy duty applications.



Robust features, meaningful benefits

Versatile connection systems

- A complete portfolio of connectors, accessories, terminals, seals, and hand crimp tools
- Terminal flexibility: interchangeable with other industry terminals
- Mounting flexibility: panel, strap/clip, and bracket
- Application flexibility: perfect for cab, chassis, engine compartment, and on-engine applications
- Offered in both non-V0 and V0 materials

Unparalleled reliability and performance

Improved vibration resistance

- Up to 30G sine, 20Grms random 330 hrs./axis
- Robust back shells

High temperature ratings

- Up to -40 to +140°C

Superior environmental protection

- Additional connector shielding for protection against debris ingress

Designed for the transportation market

- Robust solution from an electrical component expert with over 100 years of experience
- Meets or exceeds a wide range of commercial vehicle validation standards

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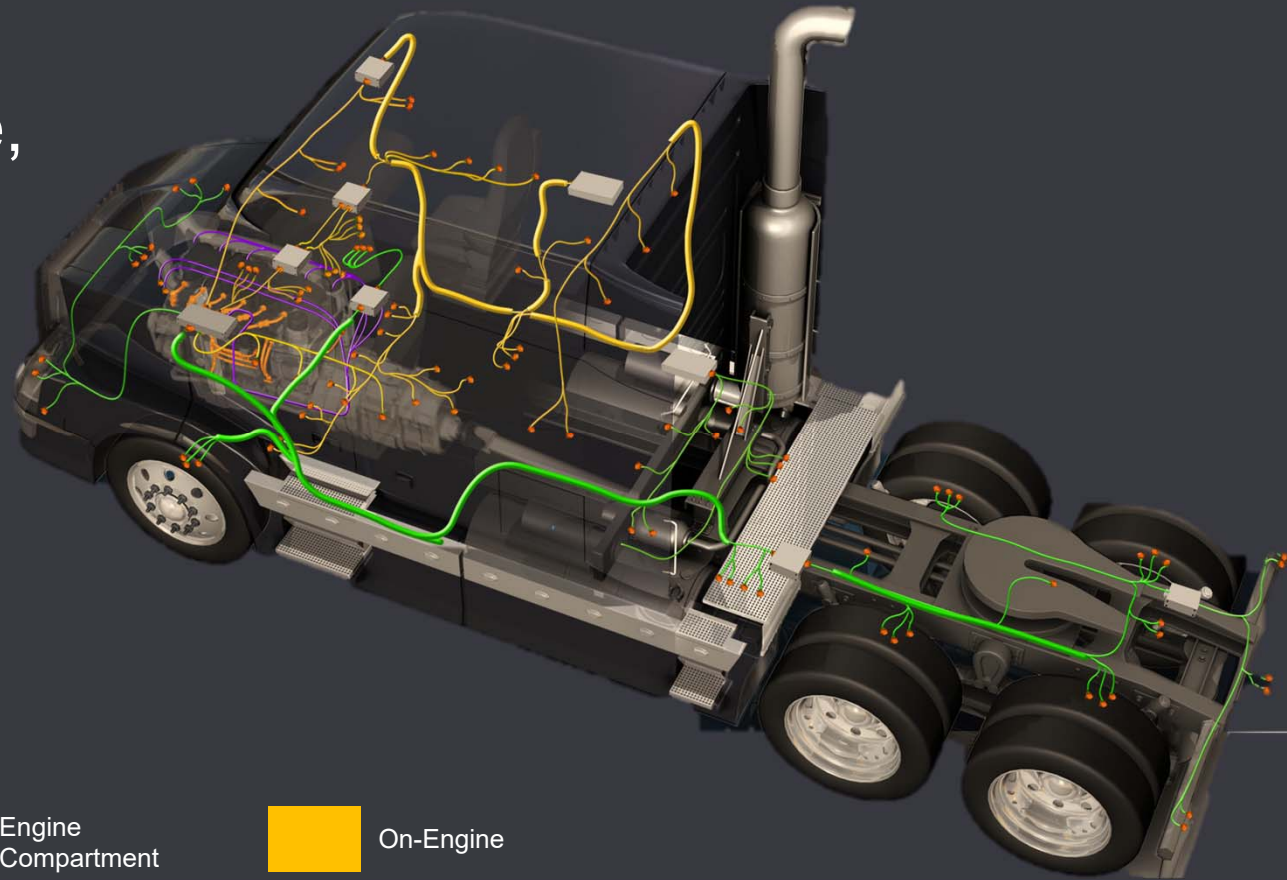
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The broad CTCS family covers virtually every application in a vehicle, ranging from unsealed in-cab to sealed on-engine.



Cab



Chassis



Engine
Compartment



On-Engine

A wide family range



Connectors

- Inline and device applications
- 2 through 62 way configurations
- Sealed and unsealed applications
- Two different lock assist mechanisms for sealed connectors: Slider lock and Lever lock



Terminals

- 1.5, 2.8, and 6.3 mm blade sizes
- 0.08-6.0 mm² / 28-10 AWG cable sizes
- Tin, silver, and gold plating options



Seals

- Cable seals and cavity plugs
- Cover all CTCS cavity sizes



Accessories

- 180° or 90° back shells
- 1.0-3.5 mm fixing slides
- Caps
- Clips and wire ties



HellermannTyton

Hand Crimp Tool

- Covers female and male terminals
- No solder required



The **right connector** for the right job



Performance	Unsealed Series	SP Series	XP Series
Max vibration: Sine(G) /Random(Grms)	n/a / 2.17	23.9 / 12.4	30.6 / 18
Max temperature (°C):	-40 to +85	-40 to +120	-40 to +140
Sealing IP (IEC / ISO):	5 / 5k	67. 69 / 6K7, 6K9K	67. 69 / 6K7, 6K9K
Flame resistance:	Non-V0	Non-V0 and V0	Non-V0 and V0
Available cavity configurations:	4, 18, 25, 36	15, 21, 26, 39, 62	2, 3, 4, 6, 7, 8, 10, 12, 15, 16, 18
Mounting options:	None	Panel and Bracket	Panel and Strap/Clip
Lock assist type:	Standard and Lever lock	Lever lock	Slider lock
Applications:	Cab	Chassis and engine compartment	Chassis, engine compartments and on-engine

Connector range



# of ways	Performance series	Lock assist type	Gender	Male mounting type	Available terminal configurations	Applications
Sealed Connectors						
2	XP	Slider lock	Male & Female	Panel & Strap/Clip	1.5, 2.8, 6.3	Inline & Device
3	XP	Slider lock	Male & Female	Panel & Strap/Clip	1.5	Inline & Device
4	XP	Slider lock	Male & Female	Panel & Strap/Clip	2.8	Inline & Device
6	XP	Slider lock	Female	Panel & Strap/Clip	1.5	Device
7	XP	Slider lock	Male & Female	Panel & Strap/Clip	1.5/2.8	Inline & Device
8	XP	Slider lock	Male & Female	Panel & Strap/Clip	1.5, 2.8	Inline & Device
10	XP	Slider lock	Male & Female	Panel	1.5/2.8	Inline & Device
12	XP	Slider lock	Male & Female	Panel	1.5	Inline & Device
15	XP	Slider lock	Male & Female	Panel	1.5/2.8	Inline & Device
16	XP	Slider lock	Male & Female	Panel & Strap/Clip	1.5/2.8	Inline & Device
18	XP	Slider lock	Male & Female	Panel & Strap/Clip	1.5	Inline & Device
15	SP	Lever lock	Female	-	2.8	Device
21	SP	Lever lock	Male & Female	Panel	2.8	Inline & Device
26	SP	Lever lock	Male & Female	Panel	1.5/2.8/6.3	Inline & Device
39	SP	Lever lock	Male & Female	Panel & Strap/Clip	2.8	Inline & Device
62	SP	Lever lock	Male & Female	Panel & Strap/Clip	1.5/2.8	Inline & Device

Connector and accessory range



# of ways	Performance series	Lock assist type	Gender	Male mounting type	Available terminal configurations	Applications
Unsealed Connectors						
4	Unsealed	Standard	Female	-	6.3	Device
18	Unsealed	Standard	Female	-	2.8	Device
25	Unsealed	Lever lock	Female	-	1.5/2.8	Device
36	Unsealed	Lever lock	Female	-	1.5	Device



Accessory type	Conduit diameter (mm)	Wall thickness (mm)	Available angles
Back shell	7.5-17	-	90° & 180°
Fixing slide	-	1.0-3.5	-
Cap	-	-	-

Terminal, seal and hand crimp tool range



Blade size (mm)	Family name	Gender	Sealing	Base material	Plating options	Cable range (mm ²)	SAE gage (awg)
1.5	CTS	F	Sealed & Unsealed	CuFe, CuNiSi	Sn, Au, Ag	0.08-1.5	28-16
1.5	CTS	M	Sealed & Unsealed	CuFe	Sn, Au, Ag	0.08-1.5	28-16
2.8	CTS	F	Sealed & Unsealed	CuNiSi	Sn, Ag	0.08-5.0	28-10
2.8	CTS	M	Sealed & Unsealed	CuFe	Sn, Ag	0.22-2.5	24-14
6.3	CTS	F	Sealed & Unsealed	CuFe	Sn, Ag	0.35-6.0	22-10



Seal type	Blade size (mm)	Outside diameter (mm)	Material	Available colors
Cable	1.5	1.2-2.1	LSR	Red, gray, yellow
Cable	2.8	1.2-3.0	LSR	Blue, white
Cable	6.3	1.2-5.3	LSR	Yellow, white, red-brown, green, gray
Plug	1.5	-	LSR	White
Plug	2.8	-	LSR	Red-brown, white, green
Plug	6.3	-	LSR	Green



Terminal	Cable range (mm ²)	SAE gage (awg)	Insulation type
CTS 1.5	0.35-2.0	24-14	PVC or XLPE
CTS 2.8	0.50-3.0	22-12	PVC or XLPE
CTS 6.3	0.75-3.0	20-12	PVC or XLPE

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Connector design overview

Background

- Seamless “drop-in” replacement
- Interchangeability – cross mating capability

Design features

- Additional features for protection from ingress of dust
- Improved panel seal for maximum retention
- Cover design optimized for maximum conduit retention and protection of wire insulation from wear
- Improved robustness of locking slides
- Increased distance between pre-position and end-position in secondary locks, for better detection of unseat terminals



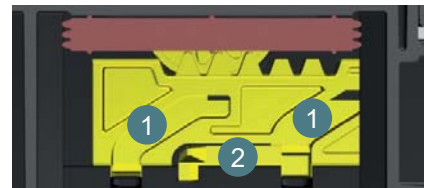
Robust Design

Designed for maximum strength and protection from mud and dust.



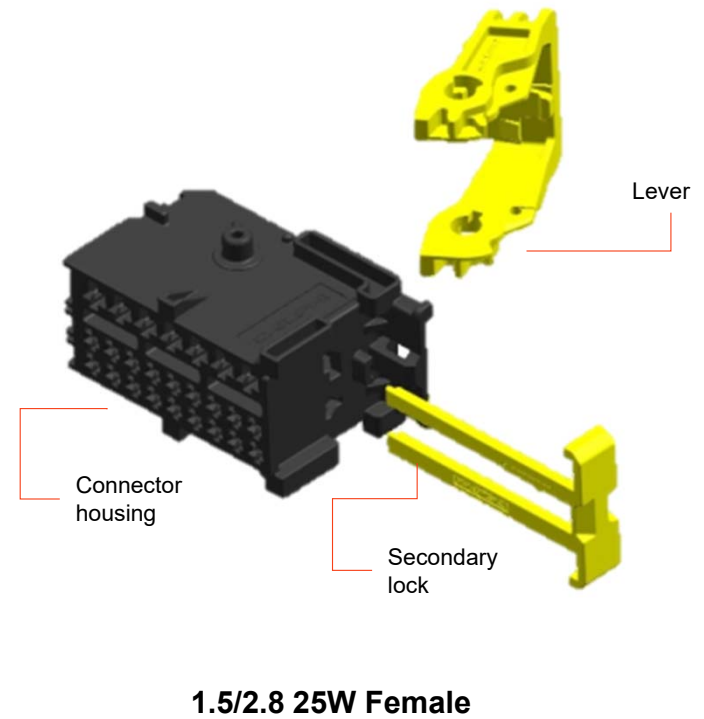
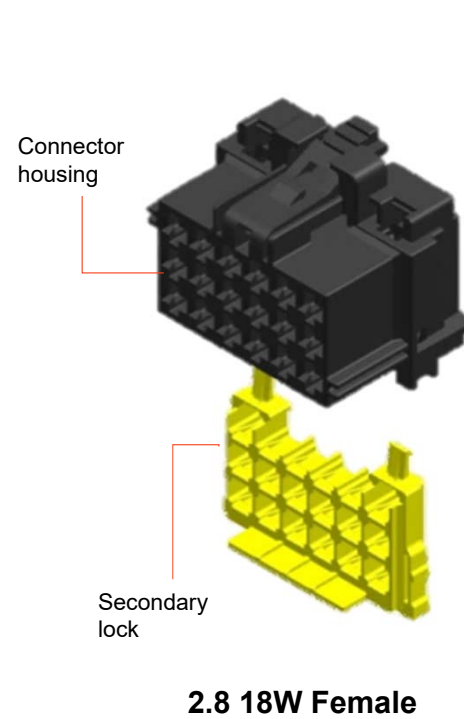
- 1 Heavy ribbing
- 2 Strapping points fully integrated with cover for maximum retention of harness
- 3 Four shrouded locks

Pre-staged locking mechanism

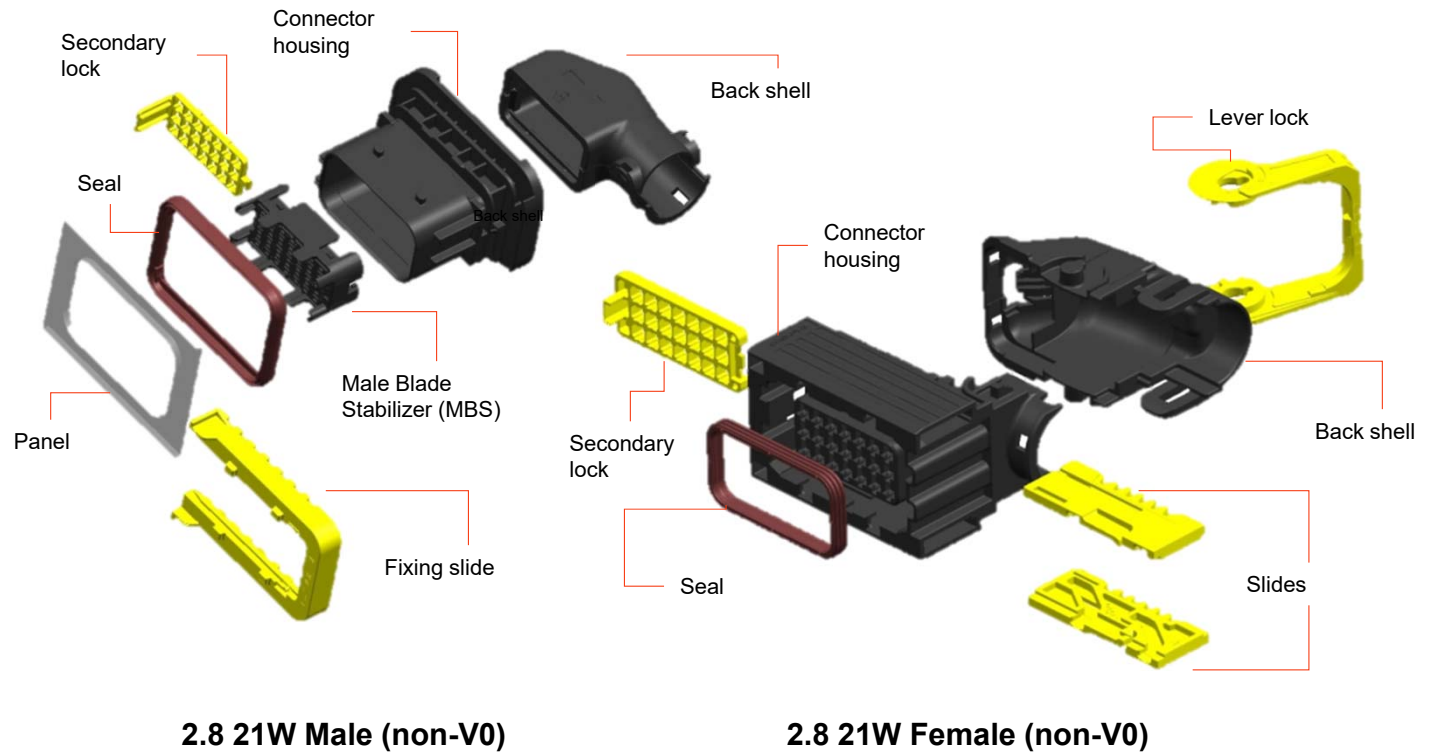


- 1 Pre-staging features in slider to aid in proper mating
- 2 Slider Lock is firmly retained and only released upon installation on to mating connector

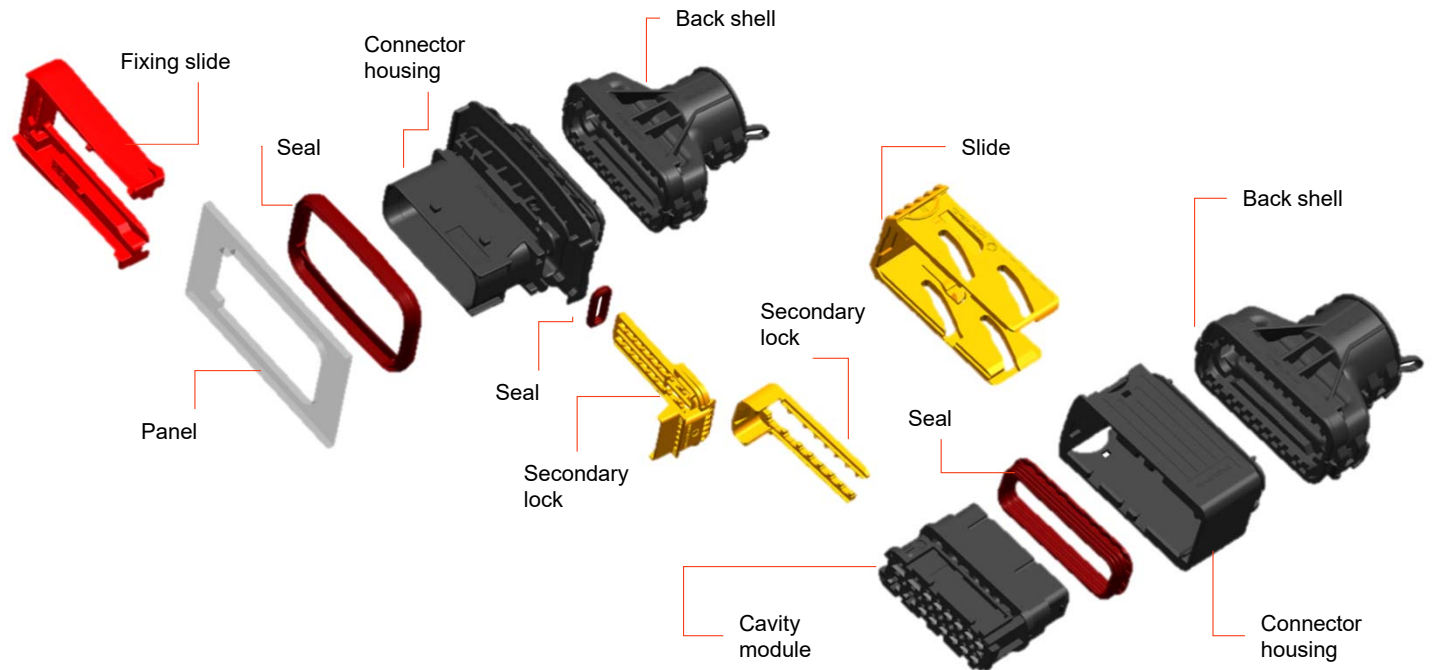
CTCS Unsealed exploded view



CTCS SP exploded view



CTCS XP exploded view



1.5/2.8 16W Male (V0)

1.5/2.8 16W Female (V0)

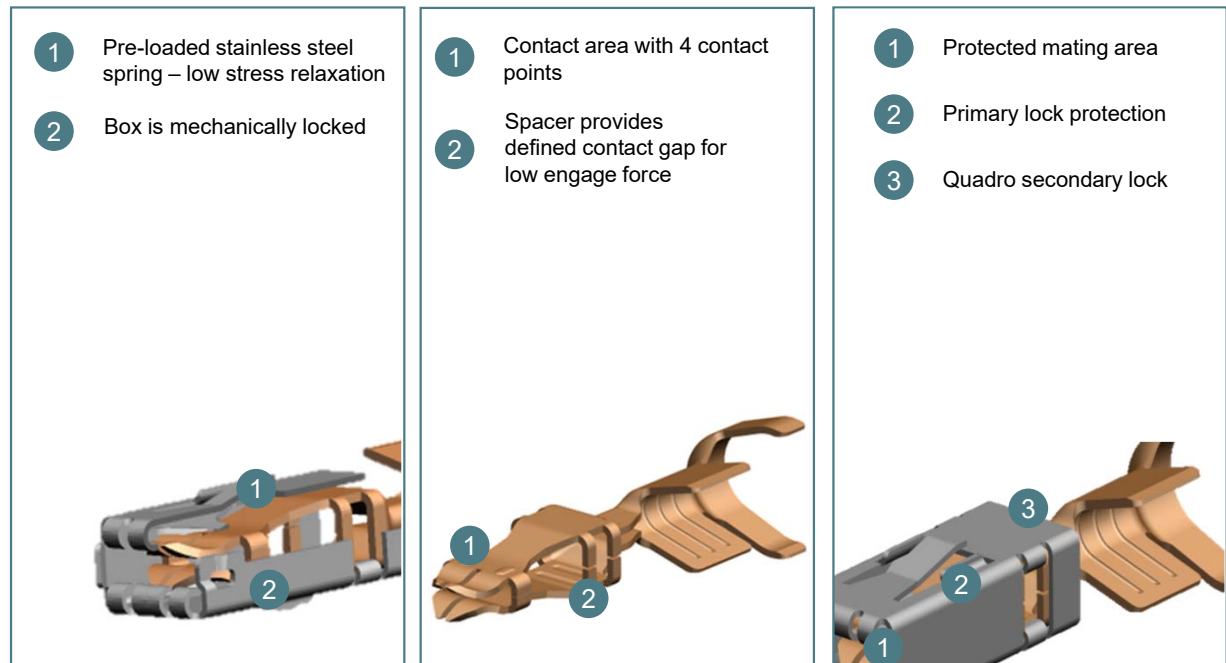
CTS Terminal design overview

Design features

- Protected mating area
- Spring loaded contact area for low relaxation
- Primary lock protection
- High performance base material
- Safety sleeve locking system, no laser welding necessary
- 100% vision-controlled manufacturing
- 2-piece tanged terminal system
- No misalignment of mating parts
- Defined contact gap and forces
- Industry standard mechanical features

Crimp tooling

- Available for both hand crimping and applicator dies



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CTCS Unsealed Series **main part numbers**


Unsealed Series	Cavity Count	CTS Blade Size (mm)	Gender	Index	Part Number
	4	6.3	F	A	33136690
	18	2.8	F	A	35129604
	25	1.5 / 2.8	F	A	33219796
	36	1.5	F	A	33252408
					Other indexes (B-D) are also available

CTCS SP Series **main part numbers**

SP Series	Cavity Count	CTS Blade Size (mm)	Gender	Index	V0 Part Number	Non-V0 Part Number
	15	2.8	F	A	33188785	33276642
	21	2.8	F	A	33101162	33276630
	21	2.8	M	A	33237993	33276634
	26	1.5 / 2.8 / 6.3	F	A	33207220	33283998
	26	1.5 / 2.8 / 6.3	M	A	33207134	33284519
	39	2.8	F	A	33111401	33273782
	39	2.8	M	A	33198862	33276705
	62	1.5 / 2.8	F	A	33337577	33337581
	62	1.5 / 2.8	M	A	33213199	33276719


Other indexes (B-D) are also available.

CTCS XP Series **main part numbers**

XP Series	Cavity Count	CTS Blade Size (mm)	Gender	Index	Mount	V0 Part Number	Non-V0 Part Number
	2	1.5	F	A	Universal	33253266	33344638
	2	2.8	F	A	Universal	33253554	33344639
	2	2.8	M	A	Panel	33254221	33344850
	2	6.3	F	A	Universal	33285119	33346221
	2	6.3	M	A	Panel	33285118	33346220
	2	6.3	M	A	Strap	33341148	33347784
	3	1.5	F	A	Universal	33253275	33344674
	3	1.5	M	A	Panel	33254285	33344669
	3	1.5	M	A	Strap	33254098	33344861
	4	2.8	F	A	Universal	33308974	33346865
	4	2.8	M	A	Panel	33308731	33346867
	4	2.8	M	A	Strap	33308978	33346866


Other indexes (B-D) are also available

CTCS XP Series **main part numbers**

XP Series	Cavity Count	CTS Blade Size (mm)	Gender	Index	Mount	V0 Part Number	Non-V0 Part Number
	6	1.5	F	A	Universal	33308961	33346852
	6	1.5	M	A	Panel	33308982	33347865
	6	1.5	M	A	Strap	33308912	33347886
	7	1.5 / 2.8	F	A	Universal	33285164	33346265
	7	1.5 / 2.8	M	A	Panel	33285120	33346256
	7	1.5 / 2.8	M	A	Strap	33341403	33346260
	8	1.5	F	A	Universal	33341417	33346281
	8	1.5	M	A	Panel	33341408	33346266
	8	1.5	M	A	Strap	33341413	33347532
	8	2.8	F	A	Universal	33343499	33350336
	8	2.8	M	A	Strap	TBD	TBD


Other indexes (B-D) are also available

CTCS XP Series **main part numbers**

XP Series	Cavity Count	CTS Blade Size (mm)	Gender	Index	Mount	V0 Part Number	Non-V0 Part Number
	10	1.5 / 2.8	F	A	Universal	33344008	33350438
	10	1.5 / 2.8	M	A	Panel	33343722	33350430
	10	1.5 / 2.8	M	A	Strap	TBD	TBD
	12	1.5	F	A	Universal	33340130	33350122
	12	1.5	M	A	Panel	33340243	33350115
	12	1.5	M	A	Strap	TBD	TBD
	15	1.5 / 2.8	F	A	Universal	33344005	33347873
	15	1.5 / 2.8	M	A	Panel	33343701	33349151
	15	1.5 / 2.8	M	A	Strap	TBD	TBD
	16	1.5 / 2.8	F	A	Universal	33285172	33347875
	16	1.5 / 2.8	M	A	Panel	33285171	33347859
	16	1.5 / 2.8	M	A	Strap	33342243	33347860

Other indexes (B-D) are also available.

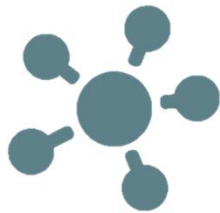
CTCS XP Series **main part numbers**

XP Series	Cavity Count	CTS Blade Size (mm)	Gender	Index	Mount	Non-V0 Part Number	Non-V0 Part Number
	18	1.5	F	A	Universal	33342277	33347876
	18	1.5	M	A	Panel	33342293	33347872
	18	1.5	M	A	Strap	33342234	33347874

Other indexes (B-D) are also available

Why CTCS?

**Application
versatility**



**Unparalleled
reliability &
performance**



**Designed for the
transportation
market**



Our solution to the market's most stringent regulations and demanding operating environment.

Thank you.