

PORTS, MARINAS, SHIPYARDS & VESSELS



INDUSTRIAL PLUGS & SOCKET-OUTLETS

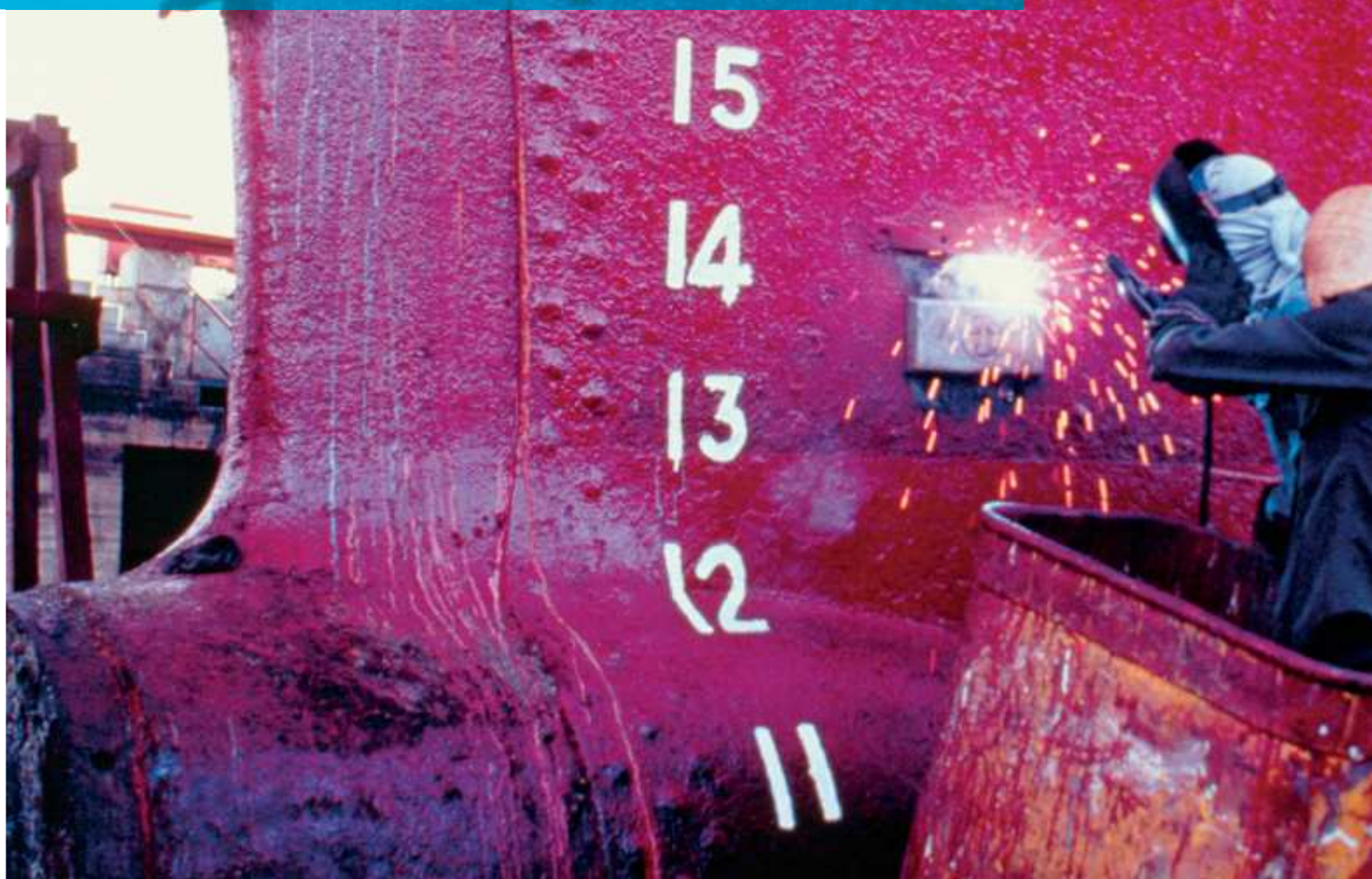
SAFE AND RELIABLE ELECTRICAL CONNECTIONS IDEALLY SUITED TO PORTS, MARINAS, SHIPYARDS & VESSELS

MARECHAL ELECTRIC offers a range of products suited to your applications.

The ports, marinas, shipyards & vessels industries require products that meet specific criteria and requirements. To satisfy the many needs linked to this activity, MARECHAL ELECTRIC provides you with a wide range of electrical connection solutions which reduce the time and means required for operations:

- Reliability
- Speed
- Flexibility
- Quality

... always with the goal to ensure safety for staff and equipment.





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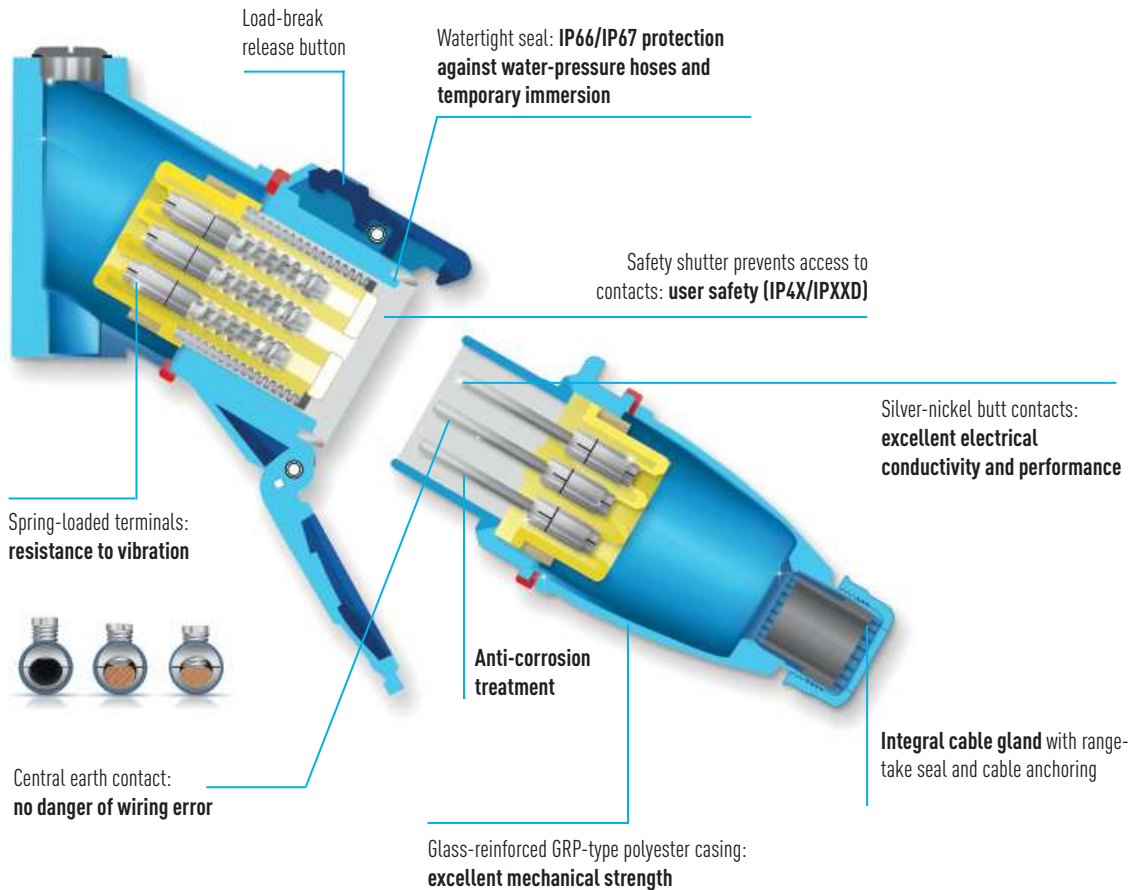


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MARECHAL ELECTRIC TECHNOLOGY

The MARECHAL® industrial electrical power socket has a built-in switching function called DECONTACTOR™. This technology makes it possible to connect and disconnect motors in absolute safety, with the ease of "Plug & Play". They provide unequalled strength over time and guarantee a fast and safe operation during maintenance work. They comply with the IEC EN 60309-1 standard and the European Low Voltage Directive.



DECONTACTOR™ technology: tested safety

- ▶ A socket with built-in switch in a compact unit.
- ▶ Simply pressing the button once cuts off the current and eliminates all risk of electrical arcing.
- ▶ The plugs then eject automatically and the appliance is off-load.
- ▶ The safety of users is guaranteed at all times.

Connection quality and life expectancy

MARECHAL® products are fitted with spring-loaded contacts providing a permanent and durable contact. The silver-nickel tipped contacts at the end of the contacts provide exceptional connection quality and excellent resistance to wet and corrosive environments, even after years of use.



IP66/IP67 sealing

IP66/IP67 sealing is automatic as soon as the plug is inserted or once the socket lid is closed manually.

Endurance to over currents and 100% duty factor

DECONTACTOR™ plugs can carry significant overloads: 2 to 8 times more than it's required by the standard IEC 60309-1. It supports a voltage up to 1 000 V a.c. and up to 250 V d.c., permanent or alternating current without damages or overheating.

Marine certification of the DSN/DS/DXN/SP/SPeX ranges by Bureau Veritas



MARECHAL® connectors and plugs and sockets are already used in marine applications for more than 20 years, especially for navy and Oil&Gas projects.

FASTER, SAFER, EASIER.

Harsh environment: Salt corrosion, humidity, temperature changes and mechanical shocks lead to bad connection and overheating, and ultimately failure. While brass copper contacts suffer from oxidization in a humid and salty environment, our technology ensures you a high and continuous performance. Our design uses silver-nickel butt contacts which resist to corrosion. The DECONTACTOR™ is automatically IP66/IP67 watertight and resists to water jetting and temporary immersion. Our quality material allows high resistance to frequent mechanical shocks (IK08 / IK09) and temperature changes (-40 °C to +60 °C). Power supply is always available when needed, even after years in use.

Crane connections: Process equipment such as a crane is frequently moved from one ship to another. The DECONTACTOR™'s integral load-breaking capability simplifies connection and disconnection procedures. It can be easily operated by one single person, saving time and money.

Economic solution: Thanks to its high resistance to shipyards conditions and handling several times per day, MARECHAL® plugs have a long lifetime and then cost saving.

Simple and effortless: To connect or disconnect a standard plug and socket with 250 A or more needs much physical effort, especially when corrosion and overheating has deformed the sleeves in the socket. MARECHAL®'s butt-contact technology is used on DS4 plugs and sockets (up to 400 A), PF plugs and sockets (up to 600 A) and SP single pole connectors (up to 700 A and more). The technology and the superior materials used prevent heating and corrosion. Connection remains effortless even after years in use.



ENSURE LONG WORKING LIFE IN HARSH ENVIRONMENTS



Crane connections



Ship-to-shore connections



Conveyors



Marinas



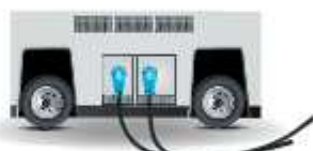
Compressors



Distribution boxes



Pumps



Converters

DSN

WATERTIGHT DECONTACTOR™ PLUGS 20 A / 32 A / 63 A

Covering sizes from 20 to 63 A, DSN DECONTACTOR™ plugs are noted for their small footprint. The socket + plug combination is automatically IP66/IP67 as soon as the plug is inserted or once the cover is closed.

- ▶ Automatic IP66/IP67
- ▶ Built-in AC-22 and AC-23 switching capability
- ▶ Shock-resistant GRP casing

SPECIFICATION

Plug and socket-outlet with incorporated load-breaking capacity AC-22 / AC-23, IP66/IP67 without additional operation, safety shutter (socket IP4X/IPXXD) silver-nickel butt contacts and metallic braid.



MAIN FEATURES

Rated current (In)	20 A	32 A	63 A
Umax	500 V	690 V	1 000 V
AC-22 switching capability	20 A / 500 V	32 A / 690 V	63 A / 690 V
AC-23 switching capability	20 A / 400 V (5,5 kW)	32 A / 400 V (7,5 kW)	63 A / 400 V (18,5 kW)
Auxiliary contacts	-	2	4
Keying positions ⁽¹⁾	24 for all DSN		
IP protection lid closed	IP66/IP67 for all DSN		
IP protection connected plug	IP66/IP67 for all DSN		
Ambient temperature	-40°C to +60°C for all DSN		
Shock resistance	IK08 for all DSN		
Flexible wiring [min. – max.]	1 - 2,5 mm ²	2,5 - 6 mm ²	6 - 16 mm ²
Stranded wiring [min. – max.]	1,5 - 4 mm ²	2,5 - 10 mm ²	10 - 25 mm ²
Short circuit current [Icc]	10 kA for all DSN		

⁽¹⁾ To distinguish between different power supplies and applications.



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Alternative products in explosion-proof versions

DXN COMPACT ATEX DECONTACTOR™
From 20 A up to 63 A - 750 V

- ▶ II2 G D Ex de IIC
- ▶ IP66/IP67 water- and dust-tight
- ▶ Integrated load-break switch
- ▶ Robust and compact design
- ▶ High performance poly casing



DS

COMPACT DECONTACTOR™ PLUGS

30 A / 50 A / 90 A / 150 A / 250 A

DS DECONTACTOR™ is our widest range offering rated currents from 30 to 250 A. Polyester casings from 30 to 90 A and metal casings from 90 to 250 A, providing the user with many options (padlocking, auxiliary contacts ...).

- ▶ Safe load-breaking up to 250 A
- ▶ Safety shutter
- ▶ GRP or metal casing

SPECIFICATION

IP54/ IP55 Plug and socket-outlet with incorporated AC-22 / AC-23 load-breaking device, safety shutter (IP4X/IPXX socket-outlet), silver-nickel butt contacts with metallic braid.



MAIN FEATURES

	DS1 GRP	DS3 GRP	DS6 GRP*	DS9 GRP*	DS2 METAL
Rated current (In)	30 A	50 A	90 A	150 A	250 A
Umax	690 V	1 000 V	1 000 V	1 000 V	1 000 V
AC-22 switching capability	16 A / 690 V	32 A / 690 V	63 A / 690 V	150 A / 400 V	250 A / 400 V
AC-23 switching capability	30 A / 400 V	50 A / 400 V	90 A / 400 V	100 A / 440 V	160 A / 440 V
Auxiliary contacts	2	4	4	6	7
Keying positions ⁽¹⁾	24	24	24	24	12
IP protection lid closed	IP55	IP55	IP55	IP66/IP67	IP55
IP protection connected plug	IP54	IP54	IP54	IP66/IP67	IP54
Ambient temperature	-40°C to +60°C for all DS				
Shock resistance	IK08	IK08	IK08	IK08	IK09
Flexible wiring [min. – max.]	2,5 - 6 mm ²	4 - 16 mm ²	10 - 25 mm ²	25 - 70 mm ²	70 - 95 mm ²
Stranded wiring [min. – max.]	2,5 - 10 mm ²	4 - 25 mm ²	10 - 35 mm ²	25 - 95 mm ²	70 - 120 mm ²
Short circuit current [Icc]	10 kA for all DS				

⁽¹⁾ To distinguish between different power supplies and applications

* A metal option is available.



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DN

ROBUST DECONTACTOR™ PLUGS 20 A / 30 A / 50 A / 90 A / 150 A

Its metal casings rugged design remains a favourite with industries requiring robust connections. Each DECONTACTOR™ size accepts a wide range of cable diameters. This makes the DN series very appropriate for shipyards applications.

- ▶ Automatic IP54/IP55 watertight
- ▶ Impact-resistant metal casing
- ▶ Suitable for harsh environments

SPECIFICATION

Metal-casing plug and socket-outlet with integral switching device AC-22, silver-nickel butt contacts with metallic braid.



MAIN FEATURES

	DN8*	DN1	DN3	DN6	DN9
Rated current (In)	20 A	30 A	50 A	90 A	150 A
Umax	500 V	500 V	500 V	500 V	415 V
AC-22 switching capability	20 A / 400 V	30 A / 400 V	50 A / 400V	90 A / 400 V	150 A / 400 V
Auxiliary contacts	-	-	-	4	-
Keying positions ⁽¹⁾	16	16	16	16	4
IP protection lid closed	IP55 for the whole range				
IP protection connected plug	IP54 for the whole range				
Ambient temperature	-40°C to +60°C for the whole range				
Shock resistance	IK09 for the whole range				
Flexible wiring [min. – max.]	1 - 6 mm ²	2,5 - 6 mm ²	2,5 - 16 mm ²	10 - 25 mm ²	16 - 50 mm ²
Stranded wiring [min. – max.]	1,5 - 10 mm ²	2,5 - 10 mm ²	2,5 - 25 mm ²	10 - 35 mm ²	16 - 70 mm ²

⁽¹⁾ To distinguish between different power supplies and applications

* DN8 is presented in the metal option. A GRP option is available.





DS4

HIGH-CURRENT CONNECTORS 400 A / 1 000 V

The DS4 socket-outlet offers a compact solution for connections up to 400 A / 1000 V. It is equipped in standard with an easy inlet closing device made of stainless steel. The DS4 socket-outlets are especially suitable for cranes (e.g. in harbours).

- ▶ 2 pilot contacts as standard
- ▶ Electrical locking system
- ▶ Insertion mechanism



■ MAIN FEATURES

	DS4
Rated current (I _n)	400 A
U _{max}	1 000 V
Connectors without breaking capacity	
Pilot contacts for electrical interlock	2
IP protection	IP54 (IP66/IP67 optional)
Ambient temperature	-40°C to +60°C
Shock resistance	IK09
Flexible wiring [min. – max.]	70-150 mm ²
Stranded wiring [min. – max.]	70-185 mm ²
Mechanical interlock	
Inlet closing device in stainless steel	



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DS4 boxes / 400 A up to 1000 V

The DS4 is also available as a complete box, equipped with a contactor, LED signal lights and ON/OFF emergency push button.



PF

HEAVY-DUTY PLUGS & SOCKETS

315 A / 400 A / 500 A / 600 A

Heavy-duty equipment and gensets power supply: in quarries, tunnel boring machines, port cranes, mining equipment...

- ▶ Up to 1 000 V
- ▶ Automatic IP66/IP67 protection
- ▶ Mechanical and electrical interlocking
- ▶ Up to 6 auxiliaries and 2 pilot contacts

SPECIFICATION

315 to 600 A, IP66/IP67 socket-outlets with separate connection of phases and pilots (pilots first), safety shutter (IP4X/IPXXD socket-outlet) solid silver butt-contacts.

MAIN FEATURES

	PFQ3	PFQ4	PFC4	PFC5	PFC6
Rated current (In)	315 A	400 A	400 A	500 A	600 A
Umax	690 V	690 V	1 000 V	1 000 V	1 000 V
Auxiliary contacts	6	6	2	2	2
Pilot contacts	2	2	2	2	2
Keying positions ⁽¹⁾	10	10	7	7	7
IP protection lid closed	IP66/IP67 for the whole range				
IP protection connected plug	IP66/IP67 for the whole range				
Ambient temperature	-40°C to +60°C for the whole range				
Shock resistance	IK10 for the whole range				
Flexible wiring [min. – max.]	95-185 mm ²	95-185 mm ²	95-240 mm ²	95-240 mm ²	95-240 mm ²
Stranded wiring [min. – max.]	95-185 mm ²	95-185 mm ²	95-240 mm ²	95-240 mm ²	95-240 mm ²

⁽¹⁾ To distinguish between different power supplies and applications





SP

SINGLE POLE POWER CONNECTORS 700 A / 1 000 V

Thanks to the butt-contact technology the SP single pole connector accepts a permanent current of 700 A / 1 000 V a.c. or 1500 V d.c. [connection with 70 to 400 mm² cable sections].

- ▶ Up to 700 A / 1 000 V
- ▶ Automatic IP66/IP67 protection
- ▶ Electromechanical interlocking system



■ MAIN FEATURES

	SP
Rated current (I _n)	700 A For higher currents, contact us
Maximum a.c. voltage	1 000 V
Maximum d.c. voltage	1 500 V
Keying positions	mechanical [5] and visual
IP protection lid closed	IP66/IP67
Ambient temperature	-40 °C to +60 °C
Shock resistance	IK08
Flexible wiring [min. - max.]	50 - 400 mm ²
Short circuit current [I _{cc}]	20 kA for 250 ms
Number of operations	2000
Pre-wired pilot circuit	6 A / 250 V



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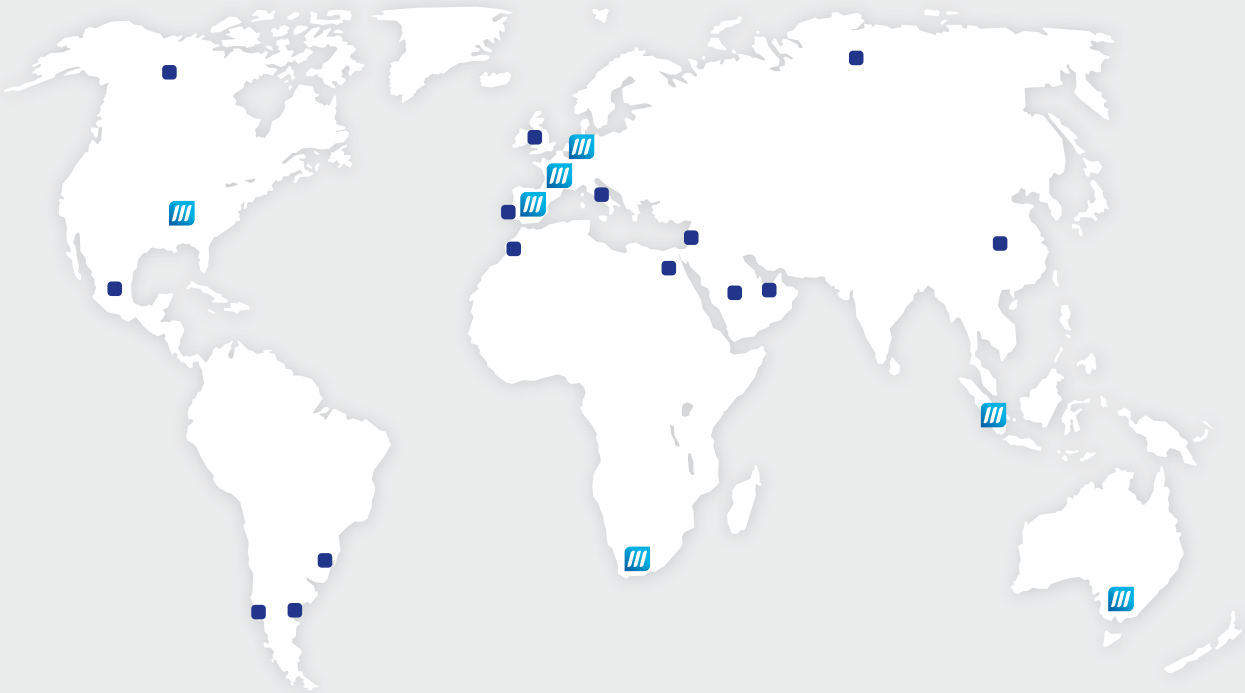
Alternative products in explosion-proof versions

SPeX EXPLOSION-PROOF SINGLE POLE POWER CONNECTOR - 680 A - 1 000 V

- ▶ II 2 G D Ex e IIC
- ▶ IP65/IP66 water- and dust-tight
- ▶ Electromechanical interlocking system
- ▶ Mechanic and visual keying



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