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# Technical information

## Protective treatment of equipment according to climatic environment

Depending on the climatic and environmental conditions in which the equipment is placed, Schneider Electric can offer specially adapted products to meet your requirements.

In order to make the correct choice of protective finish, two points should be remembered:

- the prevailing climate of the country is never the only criterion,
- only the atmosphere in the immediate vicinity of the equipment need be considered.

### All climates treatment "TC"

This is the standard treatment for Telemecanique brand equipment and is suitable for the vast majority of applications. It is the equivalent of treatments described as "Klimafest", "Climateproof".

In particular, it meets the requirements specified in the following publications:

- Publication UTE C 63-100 (method I), successive cycles of humid heat at:
  - + 40 °C and 95 % relative humidity.
- DIN 50016 - Variations of ambient conditions within a climatic chamber:
  - + 23 °C and 83 % relative humidity,
  - + 40 °C and 92 % relative humidity.

It also meets the requirements of the following marine classification societies: BV-LR-GL-DNV-RINA.

### Characteristics

- Steel components are usually treated with zinc. When they have a mechanical function, they may also be painted.
- Insulating materials are selected for their high electrical, dielectric and mechanical characteristics.
- Metal enclosures have a stoved paint finish, applied over a primary phosphate protective coat, or are galvanised (e.g. some prefabricated busbar trunking components).

### Limits for use of "TC" (All climates) treatment

- "TC" treatment is suitable for the following temperatures and humidity:

Temperature (°C)	Relative humidity (%)
20	95
40	80
50	50

"TC" treatment is therefore suitable for all latitudes and in particular tropical and equatorial regions where the equipment is mounted in normally ventilated industrial premises. Being sheltered from external climatic conditions, temperature variations are small, the risk of condensation is minimised and the risk of dripping water is virtually non-existent.

### Extension of use of "TC" (All climates) treatment

In cases where the humidity around the equipment exceeds the conditions described above, or in equatorial regions if the equipment is mounted outdoors, or if it is placed in a very humid location (laundries, sugar refineries, steam rooms, etc.), "TC" treatment can still be used if the following precautions are taken:

- The enclosure in which the equipment is mounted must be protected with a "TH" finish (see next page) and must be well ventilated to avoid condensation and dripping water (e.g. enclosure base plate mounted on spacers).
- Components mounted inside the enclosure must have a "TC" finish.
- If the equipment is to be switched off for long periods, a heater must be provided (0.2 to 0.5 kW per square decimetre of enclosure), that switches on automatically when the equipment is turned off. This heater keeps the inside of the enclosure at a temperature slightly higher than the outside surrounding temperature, thereby avoiding any risk of condensation and dripping water (the heat produced by the equipment itself during normal running is sufficient to provide this temperature difference).
- Special considerations for "Operator dialog" and "Detection" products: for certain pilot devices, the use of "TC" treatment can be extended to outdoor use provided their enclosure is made of light alloys, zinc alloys or plastic material. In this case, it is also essential to ensure that the degree of protection against penetration of liquids and solid objects is suitable for the applications involved.

# Technical information

## Protective treatment of equipment according to climatic environment

### “TH” treatment for hot and humid environments

This treatment is suitable for hot and humid atmospheres where installations are regularly subject to condensation, dripping water and the risk of fungi.

In addition, plastic insulating components are resistant to attacks from insects such as termites and cockroaches. These properties have often led to this treatment being described as “Tropical Finish”, but this does not mean that all equipment installed in tropical and equatorial regions must systematically have undergone “TH” treatment. On the other hand, certain operating conditions in temperate climates may well require the use of “TH” treated equipment (see limitations for use of “TC” treatment).

### Special characteristics of “TH” treatment

- All insulating components are made of materials which are either resistant to fungi or treated with a fungicide, and which have increased resistance to creepage (Standards IEC 60112, NF C 26-220, DIN 5348).
- Metal enclosures receive a top-coat of stoved, fungicidal paint, applied over a rust inhibiting undercoat. Components with “TH” treatment may be subject to a surcharge (1). Please consult your Regional Sales Office.

### Protective treatment selection guide

Surrounding environment	Duty cycle	Internal heating of enclosure when not in use	Type of climate	Protective treatment	
				of equipment	of enclosure
<b>Indoors</b>					
No dripping water or condensation	Unimportant	Not necessary	Unimportant	“TC”	“TC”
Presence of dripping water or condensation	Frequent switching off for periods of more than 1 day	No	Temperate	“TC”	“TH”
		Yes	Equatorial	“TH”	“TH”
	Continuous	Not necessary	Unimportant	“TC”	“TH”
<b>Outdoors (sheltered)</b>					
No dripping water or dew	Unimportant	Not necessary	Temperate	“TC”	“TC”
			Equatorial	“TH”	“TH”
<b>Exposed outdoors or near the sea</b>					
Frequent and regular presence of dripping water or dew	Frequent switching off for periods of more than 1 day	No	Temperate	“TC”	“TH”
		Yes	Equatorial	“TH”	“TH”
	Continuous	Not necessary	Unimportant	“TC”	“TH”

These treatments cover, in particular, the applications defined by methods I and II of guide UTE C 63-100.

### Special precautions for electronic equipment

Electronic products always meet the requirements of “TC” treatment. A number of them are “TH” treated as standard.

Some electronic products (for example: programmable controllers, flush mountable controllers CCX and flush mountable operator terminals XBT) require the use of an enclosure providing a degree of protection to at least IP 54, as defined by standards IEC 60664 and NF C 20 040, for use in industrial applications or in environmental conditions requiring “TH” treatment.

These electronic products, including flush mountable products, must have a degree of protection to at least IP 20 (provided either by their own enclosure or by their installation method) for restricted access locations where the degree of pollution does not exceed 2 (a test booth not containing machinery or other dust producing activities, for example).

### Special treatments

For particularly harsh industrial environments, Schneider Electric is able to offer special protective treatments. Please consult your Regional Sales Office.

(1) A large number of the Telemecanique brand products are “TH” treated as standard and are, therefore, not subject to a surcharge.



### Standardisation

#### Conformity to standards

Telemecanique brand products satisfy, in the majority of cases, national (for example: BS in Great Britain, NF in France, DIN in Germany), European (for example: CENELEC) or international (IEC) standards. These product standards precisely define the performance of the designated products (such as IEC 60947 for low voltage equipment).

When used correctly, as designated by the manufacturer and in accordance with regulations and correct practices, these products will allow users to build equipment, machine systems or installations that conform to their appropriate standards (for example: IEC 60204-1, relating to electrical equipment used on industrial machines).

Schneider Electric is able to provide proof of conformity of its production to the standards it has chosen to comply with, through its quality assurance system.

On request, and depending on the situation, Schneider Electric can provide the following:

- a declaration of conformity,
- a certificate of conformity (ASEFA/LOVAG),
- a homologation certificate or approval, in the countries where this procedure is required or for particular specifications, such as those existing in the merchant navy.

Code	Certification authority		Country
	Name	Abbreviation	
ANSI	American National Standards Institute	ANSI	USA
BS	British Standards Institution	BSI	Great Britain
CEI	Comitato Elettrotecnico Italiano	CEI	Italy
DIN/VDE	Verband Deutscher Electrotechniker	VDE	Germany
EN	Comité Européen de Normalisation Electrotechnique	CENELEC	Europe
GOST	Gosudarstvenno Komitet Standartov	GOST	Russia
IEC	International Electrotechnical Commission	IEC	Worldwide
JIS	Japanese Industrial Standard	JISC	Japan
NBN	Institut Belge de Normalisation	IBN	Belgium
NEN	Nederlands Normalisatie Instituut	NNI	Netherlands
NF	Union Technique de l'Electricité	UTE	France
SAA	Standards Association of Australia	SAA	Australia
UNE	Asociacion Española de Normalizacion y Certificacion	AENOR	Spain

#### European EN standards

These are technical specifications established in conjunction with, and with approval of, the relative bodies within the various CENELEC member countries (European Union, European Free Trade Association and many central and eastern European countries having «member» or «affiliated» status). Prepared in accordance with the principle of consensus, the European standards are the result of a weighted majority vote. Such adopted standards are then integrated into the national collection of standards, and contradictory national standards are withdrawn. European standards incorporated within the French collection of standards carry the prefix NF EN. At the 'Union Technique de l'Electricité' (*Technical Union of Electricity*) (UTE), the French version of a corresponding European standard carries a dual number: European reference (NF EN ...) and classification index (C ...).

Therefore, the standard NF EN 60947-4-1 relating to motor contactors and starters, effectively constitutes the French version of the European standard EN 60947-4-1 and carries the UTE classification C 63-110.

This standard is identical to the British standard BS EN 60947-4-1 or the German standard DIN EN 60947-4-1.

Whenever reasonably practical, European standards reflect the international standards (IEC). With regard to automation system components and distribution equipment, in addition to complying with the requirements of French NF standards, Telemecanique brand components conform to the standards of all other major industrial countries.

### Regulations

#### European Directives

Opening up of European markets assumes harmonisation of the regulations pertaining to each of the member countries of the European Union.

The purpose of the European Directive is to eliminate obstacles hindering the free circulation of goods within the European Union, and it must be applied in all member countries. Member countries are obliged to transcribe each Directive into their national legislation and to simultaneously withdraw any contradictory regulations. The Directives, in particular those of a technical nature which concern us, only establish the objectives to be achieved, referred to as "essential requirements".

The manufacturer must take all the necessary measures to ensure that his products conform to the requirements of each Directive applicable to his production.

As a general rule, the manufacturer certifies conformity to the essential requirements of the Directive(s) for his product by affixing the CE mark.

The CE mark is affixed to Telemecanique brand products concerned, in order to comply with French and European regulations.

#### Significance of the CE mark

- The CE mark affixed to a product signifies that the manufacturer certifies that the product conforms to the relevant European Directive(s) which concern it; this condition must be met to allow free distribution and circulation within the countries of the European Union of any product subject to one or more of the E.U. Directives.
- The CE mark is intended solely for national market control authorities.
- The CE mark must not be confused with a conformity marking.

### European Directives (continued)

For electrical equipment, only conformity to standards signifies that the product is suitable for its designated function, and only the guarantee of an established manufacturer can provide a high level of quality assurance.

For Telemecanique brand products, one or several Directives are likely to be applicable, depending on the product, and in particular:

- the Low Voltage Directive 73/23/EEC amended by Directive 93/68/EEC: the CE mark relating to this Directive has been compulsory since 1st January 1997.
- the Electromagnetic Compatibility Directive 89/336/EEC, amended by Directives 92/31/EEC and 93/68/EEC: the CE mark on products covered by this Directive has been compulsory since 1st January 1996

### ASEFA-LOVAG certification

The function of ASEFA (Association des Stations d'Essais Française d'Appareils électriques - Association of French Testing Stations for Low Voltage Industrial Electrical Equipment) is to carry out tests of conformity to standards and to issue certificates of conformity and test reports. ASEFA laboratories are authorised by the French authorisation committee (COFRAC). ASEFA is now a member of the European agreement group LOVAG (Low Voltage Agreement Group). This means that any certificates issued by LOVAG/ASEFA are recognised by all the authorities which are members of the group and carry the same validity as those issued by any of the member authorities.

### Quality labels

When components can be used in domestic and similar applications, it is sometimes recommended that a "Quality label" be obtained, which is a form of certification of conformity.

Code	Quality label	Country
CEBEC	Comité Electrotechnique Belge	Belgium
KEMA-KEUR	Keuring van Electrotechnische Materialen	Netherlands
NF	Union Technique de l'Electricité	France
ÖVE	Österreichischer Verband für Electrotechnik	Austria
SEMKO	Svenska Electriska Materiel Kontrollnatanalen	Sweden

### Product certifications

In some countries, the certification of certain electrical components is a legal requirement. In this case, a certificate of conformity to the standard is issued by the official test authority.

Each certified device must bear the relevant certification symbols when these are mandatory:

Code	Certification authority	Country
CSA	Canadian Standards Association	Canada
UL	Underwriters Laboratories	USA
CCC	China Compulsory Certification	China

Note on certifications issued by the Underwriters Laboratories (UL). There are two levels of approval:

- "Recognized" (UL)** The component is fully approved for inclusion in equipment built in a workshop, where the operating limits are known by the equipment manufacturer and where its use within such limits is acceptable by the Underwriters Laboratories.  
The component is not approved as a "Product for general use" because its manufacturing characteristics are incomplete or its application possibilities are limited.  
A "Recognized" component does not necessarily carry the certification symbol.
- "Listed" (UL)** The component conforms to all the requirements of the classification applicable to it and may therefore be used both as a "Product for general use" and as a component in assembled equipment. A "Listed" component must carry the certification symbol.

### Marine classification societies

Prior approval (= certification) by certain marine classification societies is generally required for electrical equipment which is intended for use on board merchant vessels.

Code	Classification authority	Country
BV	Bureau Veritas	France
DNV	Det Norske Veritas	Norway
GL	Germanischer Lloyd	Germany
LR	Lloyd's Register	Great Britain
NKK	Nippon Kaiji Kyokai	Japan
RINA	Registro Italiano Navale	Italy
RRS	Register of Shipping	Russia

### Note

For further details on a specific product, please refer to the "Characteristics" pages in this catalogue or consult your Regional Sales Office.

### Degrees of protection against the penetration of solid bodies, water and personnel access to live parts

The European standard EN 60529 dated October 1991, IEC publication 529 (2<sup>nd</sup> edition - November 1989), defines a coding system (IP code) for indicating the degree of protection provided by electrical equipment enclosures against accidental direct contact with live parts and against the ingress of solid foreign objects or water. This standard does not apply to protection against the risk of explosion or conditions such as humidity, corrosive gasses, fungi or vermin.

Certain equipment is designed to be mounted on an enclosure which will contribute towards achieving the required degree of protection (example : control devices mounted on an enclosure).

Different parts of an equipment can have different degrees of protection (example : enclosure with an opening in the base).

Standard NF C 15-100 (December 2002 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.

Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

### IP ●●● code

The IP code comprises **2 characteristic numerals** (e.g. **IP 55**) and may include **an additional letter** when the actual protection of personnel against direct contact with live parts is better than that indicated by the first numeral (e.g. IP 20C). Any characteristic numeral which is unspecified is replaced by an X (e.g. IP XXB).

#### 1<sup>st</sup> characteristic numeral:





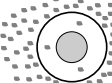



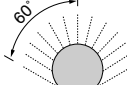

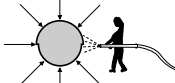
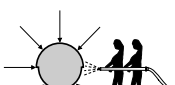
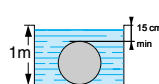
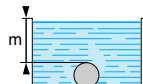
corresponds to protection of the equipment against penetration of solid objects and protection of personnel against direct contact with live parts.

#### 2<sup>nd</sup> characteristic numeral:

corresponds to protection of the equipment against penetration of water with harmful effects.

#### Additional letter:

corresponds to protection of personnel against direct contact with live parts.

Protection of the equipment		Protection of personnel	
<b>0</b>	Non-protected	Non-protected	
<b>1</b>	 Protected against the penetration of solid objects having a diameter greater than or equal to 50 mm.	Protected against direct contact with the back of the hand (accidental contacts).	
<b>2</b>	 Protected against the penetration of solid objects having a diameter greater than or equal to 12.5 mm.	Protected against direct finger contact.	
<b>3</b>	 Protected against the penetration of solid objects having a diameter greater than or equal to 2.5 mm.	Protected against direct contact with a Ø 2.5 mm tool.	
<b>4</b>	 Protected against the penetration of solid objects having a diameter > 1 mm.	Protected against direct contact with a Ø 1 mm wire.	
<b>5</b>	 Dust protected (no harmful deposits).	Protected against direct contact with a Ø 1 mm wire.	
<b>6</b>	 Dust tight.	Protected against direct contact with a Ø 1 mm wire.	
<b>0</b>	Non-protected		<b>A</b> With the back of the hand.
<b>1</b>	 Protected against vertical dripping water, (condensation).		<b>B</b> With the finger.
<b>2</b>	 Protected against dripping water at an angle of up to 15°.		<b>C</b> With a Ø 2.5 mm tool.
<b>3</b>	 Protected against rain at an angle of up to 60°.		<b>D</b> With a Ø 1 mm wire.
<b>4</b>	 Protected against splashing water in all directions.		
<b>5</b>	 Protected against water jets in all directions.		
<b>6</b>	 Protected against powerful jets of water and waves.		
<b>7</b>	 Protected against the effects of temporary immersion.		
<b>8</b>	 Protected against the effects of prolonged immersion under specified conditions.		

### Degrees of protection against mechanical impact

The European standard EN 62262 dated February 2002 defines a coding system (IK code) for indicating the degree of protection provided by electrical equipment enclosures against external mechanical impact. Standard NF C 15-100 (December 2002 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors. Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

### IK ●● code

The IK code comprises **2 characteristic numerals** (e.g. **IK 05**).

### 2 characteristic numerals:

corresponding to a value of impact energy.

		h (cm)	Energy (J)
<b>00</b>	Non-protected		
<b>01</b>		7.5	0.15
<b>02</b>		10	0.2
<b>03</b>		17.5	0.35
<b>04</b>		25	0.5
<b>05</b>		35	0.7
<b>06</b>		20	1
<b>07</b>		40	2
<b>08</b>		30	5
<b>09</b>		20	10
<b>10</b>		40	20



VCCDN 12	5/8	XBT GT4330	2/13	XCS D3719P20	3/81	XCS E7331	3/23	XCS PA593	3/40
VCCDN 20	5/8		2/28	XCS D3902G13	3/80	XCS E73317	3/23	XCS PA691	3/38
VCCF 0	5/10		2/46	XCS D3902N12	3/80	XCS E7332	3/21	XCS PA692	3/36
VCCF ●	5/10	XBT GT5230	2/13	XCS D3902P20	3/80	XCS E73327	3/21	XCS PA693	3/40
VCD 0	5/10		2/28	XCS D3910G13	3/80	XCS E7333	3/25	XCS PA791	3/38
VCD 0●	5/10		2/46	XCS D3910N12	3/80	XCS E73337	3/25	XCS PA792	3/36
VCD ●	5/10	XBT GT5330	2/13	XCS D3910P20	3/80	XCS E7341	3/23	XCS PA793	3/40
VCDN 12	5/8		2/28	XCS D3918G13	3/80	XCS E73417	3/23	XCS PA891	3/38
VCDN 20	5/8		2/46	XCS D3918N12	3/80	XCS E7342	3/21	XCS PA892	3/36
VCF 0	5/10	XBT GT6330	2/13	XCS D3918P20	3/80	XCS E73427	3/21	XCS PA893	3/40
VCF 01	5/10		2/28	XCS D3919G13	3/80	XCS E8311	3/23	XCS PA991	3/38
VCF 01GE	5/16		2/46	XCS D3919N12	3/80	XCS E83117	3/23	XCS PA992	3/36
VCF 02	5/10	XBT GT7340	2/13	XCS D3919P20	3/80	XCS E8312	3/21	XCS PA993	3/40
VCF 02GE	5/16		2/28	XCS DM379102	3/68	XCS E83127	3/21	XCS TA591	3/38
VCF ●	5/10		2/46	XCS DM379105	3/68	XCS E8313	3/25	XCS TA592	3/36
VCF ●GE	5/16	XBT Z938	2/14	XCS DM379110	3/68	XCS E8322	3/21	XCS TA593	3/40
VCFN 25GE	5/16		2/29	XCS DM3791M12	3/66	XCS E8331	3/23	XCS TA791	3/38
VCFN 32GE	5/16	XBT ZG909	2/14		3/69	XCS E83317	3/23	XCS TA792	3/36
VCFN 40GE	5/16		2/29	XCS DM480102	3/68	XCS E83417	3/23	XCS TA793	3/40
VCFX GDXE	5/17		2/47	XCS DM480105	3/68	XCS M3702L1	3/76	XCS TA891	3/38
VCFX GE1	5/17	XBY 2U	4/56	XCS DM480110	3/68	XCS M3710L1	3/76	XCS TA892	3/36
VCFX GE4	5/17	XCM 2514	4/31	XCS DM480110	3/68	XCS M3715L1	3/76	XCS TA893	3/39
VN 12	5/9	XCO M2512	4/11	XCS DM4801M12	3/69	XCS M3716L1	3/76	XCS TE5311	3/37
	5/17	XCS A501	3/22	XCS DMC5902	3/56	XCS M3902L1	3/76	XCS TE5312	3/37
VN 20	5/9	XCS A502	3/20	XCS DMC590L01M8	3/57	XCS M3910L1	3/76	XCS TE5331	3/39
	5/17	XCS A503	3/24	XCS DMC5912	3/56	XCS M3915L1	3/76	XCS TE5341	3/39
VVE ●	5/10	XCS A511	3/22	XCS DMC591L01M8	3/57	XCS M3916L1	3/76	XCS TE6311	3/39
VW3 A8 306 R	2/14	XCS A512	3/20	XCS DMC7902	3/56	XCS M4102L1	3/76	XCS TE7311	3/39
	2/47	XCS A521	3/22	XCS DMC790L01M8	3/57	XCS M4110L1	3/76	XCS TE7312	3/37
VW3 A8 306 R30	2/125	XCS A523	3/24	XCS DMC7912	3/56	XCS M4115L1	3/76	XCS TE7313	3/41
VW3 A8 306 RC	2/14	XCS A701	3/22	XCS DMC791L01M8	3/57	XCS M4116L1	3/76	XCS TE7331	3/39
	2/47	XCS A702	3/20	XCS DMP5002	3/56	XCS MP59L●	3/32	XCS TE7341	3/39
VW3 A8 306 R03	2/29	XCS A703	3/24	XCS DMP500L01M12	3/57	XCS MP70L●	3/32	XCS Z01	3/20
VW3 A8 306 R10	2/29	XCS A711	3/22	XCS DMP5012	3/56	XCS MP79L●	3/32		3/22
VW3 A8 306 R30	2/29	XCS A712	3/20	XCS DMP501L01M12	3/57	XCS MP79L●	3/32		3/24
VZ 0●	5/11	XCS A713	3/24	XCS DMP5902	3/56	XCS MP80L●	3/32	XCS Z02	3/20
	5/14	XCS A721	3/22	XCS DMP590L01M12	3/57	XCS P3702G13	3/83		3/22
VZN 0●	5/9	XCS A723	3/24	XCS DMP5912	3/56	XCS P3702N12	3/83	XCS Z03	3/20
	5/19	XCS A801	3/22	XCS DMP591L01M12	3/57	XCS P3702P20	3/83		3/22
VZN 1●	5/9	XCS A802	3/20	XCS DMP7002	3/56	XCS P3710G13	3/83		3/24
	5/19	XCS A803	3/24	XCS DMP700L01M12	3/57	XCS P3710N12	3/83	XCS Z05	3/20
VZN 2●	5/9	XCS A803	3/24	XCS DMP7012	3/56	XCS P3710P20	3/83		3/22
	5/19	XCS B501	3/22	XCS DMP701L01M12	3/57	XCS P3718G13	3/83		3/24
VZN 30	5/14	XCS B502	2/46	XCS DMP7902	3/56	XCS P3718N12	3/83	XCS Z100	3/36
			3/20	XCS DMP790L01M12	3/57	XCS P3718P20	3/83		3/38
X		XCS B503	3/24	XCS DMP7912	3/56	XCS P3719G13	3/83		3/40
XAL K01	4/44	XCS B511	3/22	XCS DMP7912	3/56	XCS P3719N12	3/83	XCS Z11	3/37
XAL K01H7	4/44	XCS B701	3/22	XCS DMP791L01M12	3/57	XCS P3719P20	3/83		3/39
XAL K178E	4/43	XCS B702	3/20	XCS DMR5902	3/56	XCS P3902G13	3/82	XCS Z12	3/37
XAL K178F	4/43	XCS B703	3/24	XCS DMR590L01M12	3/57	XCS P3902N12	3/82		3/39
XAL K178G	4/43	XCS B713	3/24	XCS DMR5912	3/56	XCS P3902P20	3/82		3/41
XAL K178H	4/43	XCS B723	3/24	XCS DMR591L01M12	3/57	XCS P3910G13	3/82	XCS Z13	3/37
XAL K188E	4/43	XCS B801	3/22	XCS DMR7902	3/56	XCS P3910N12	3/82		3/39
XAL K188F	4/43	XCS B803	3/24	XCS DMR790L01M12	3/57	XCS P3910P20	3/82		3/41
XAL K188G	4/43	XCS C501	3/22	XCS DMR7912	3/56	XCS P3918G13	3/82	XCS Z14	3/37
XB4 BS8445	4/35	XCS C502	3/20	XCS DMR791L01M12	3/57	XCS P3918N12	3/82		3/39
XB4 BS9445	4/35	XCS C511	3/22	XCS DMT	3/70	XCS P3918P20	3/82		3/41
XB4 BT845	4/35	XCS C701	3/22	XCS E5311	3/23	XCS P3919G13	3/82	XCS Z15	3/37
XB5 AS8445	4/39	XCS C702	3/20	XCS E5312	3/21	XCS P3919N12	3/82		3/39
XB5 AS9445	4/39	XCS C703	3/24	XCS E5313	3/25	XCS P3919P20	3/82		3/41
XB5 AT845	4/39	XCS C801	3/22	XCS E5321	3/23	XCS PA191	3/38	XCS Z200	3/36
XBT GT6330	2/13	XCS C803	3/24	XCS E5331	3/23	XCS PA192	3/36		3/38
	2/28	XCS D3702G13	3/81	XCS E5333	3/25	XCS PA193	3/40	XCS Z21	3/37
	2/46	XCS D3702N12	3/81	XCS E5341	3/23	XCS PA291	3/38		3/39
XBT GT7340	2/13	XCS D3702P20	3/81	XCS E5342	3/21	XCS PA292	3/36		3/41
	2/28	XCS D3710G13	3/81	XCS E7311	3/23	XCS PA293	3/40	XCS Z25	3/26
	2/46	XCS D3710N12	3/81	XCS E73117	3/23	XCS PA391	3/38	XCS Z27	3/26
XBT GT2130	2/13	XCS D3710P20	3/81	XCS E7312	3/21	XCS PA491	3/38	XCS Z28	3/36
	2/28	XCS D3718G13	3/81	XCS E73127	3/21	XCS PA492	3/36		3/38
	2/46	XCS D3718N12	3/81	XCS E7313	3/25	XCS PA493	3/40		3/40
XBT GT2330	2/13	XCS D3718P20	3/81	XCS E73137	3/25	XCS PA591	3/38	XCS Z29	3/32
	2/28	XCS D3719G13	3/81	XCS E7321	3/23	XCS PA592	3/36	XCS Z31	3/26
	2/46	XCS D3719N12	3/81	XCS E73217	3/23				

XCS Z32	3/26	XPE R510	4/19	XPS BF1132	2/211	XPS PVK3784	2/255	XUS LPZ3A0400B	3/114
XCS Z43	3/26	XPE R5100D	4/19	XPS BF1132P	2/211	XPS PVT1180	2/251	XUS LPZ3A0400M	3/113
XCS Z81	3/32	XPE R511	4/19	XPS DA3442	2/249	XPS TSA3442P	2/233	XUS LPZ3A0500B	3/114
XCS Z83	3/32	XPE R5110D	4/19	XPS DA3742	2/249	XPS TSA3742P	2/233	XUS LPZ3A0500M	3/113
XCS Z84	3/32	XPE R529	4/19	XPS DA5142	2/249	XPS TSA5142P	2/233	XUS LPZ4A0300B	3/114
XCS Z85	3/32	XPE R611	4/19	XPS DMB1132	2/237	XPS TSW3442P	2/233	XUS LPZ4A0300M	3/113
XCS Z90	3/26	XPE R711	4/19	XPS DMB1132P	2/237	XPS TSW3742P	2/233	XUS LPZ5A0300B	3/114
XCS Z91	3/36	XPE R810	4/20	XPS DME1132	2/237	XPS TSW5142P	2/233	XUS LPZ5A0300M	3/113
	3/38	XPE R811	4/20	XPS DME1132P	2/237	XPS VC1132	2/206	XUS LPZ6A0300B	3/114
	3/40	XPE R911	4/20	XPS ECM3431	2/229	XPS VC1132P	2/206	XUS LPZ6A0300M	3/113
XCS ZC1	3/58	XPE R929	4/20	XPS ECM3731	2/229	XPS VNE1142HSP	2/243	XUS LTQ6A0260	3/105
XCS ZCC	3/58	XPE Y110	4/23	XPS ECM5131	2/229	XPS VNE1142P	2/243	XUS LTQ6A0350	3/105
XCS ZCP	3/58	XPE Y211	4/23	XPS ECP3431	2/229	XPS VNE3442HSP	2/243	XUS LTQ6A0435	3/105
XCS ZCR	3/58	XPE Y310	4/23	XPS ECP3731	2/229	XPS VNE3442P	2/243	XUS LTQ6A0520	3/105
XCS ZP1	3/58	XPE Y311	4/23	XPS ECP5131	2/229	XPS VNE3742HSP	2/243	XUS LTQ6A0610	3/105
XCS ZR1	3/58	XPE Y510	4/23	XPS LCD1141	2/217	XPS VNE3742P	2/243	XUS LTQ6A0700	3/105
XE2S P4151	4/20	XPE Y511	4/23	XPS LCM1150	2/222	XSZ B130	3/58	XUS LTQ6A0785	3/105
	4/23	XPE Y611	4/23	XPS MC16Z	2/124	XSZ CM02	2/222	XUS LTQ6A0870	3/105
XE2S P4151B	4/20	XPE Y711	4/23	XPS MC16ZC	2/124	XSZ NCR03	3/121	XUS LTQ6A0955	3/105
XPE A110	4/23	XPE Z901	4/20	XPS MC16ZP	2/124	XSZ NCR10	3/121	XUS LTQ6A1045	3/105
XPE A111	4/23	XPE Z902	4/20	XPS MC32Z	2/124	XSZ NCR30	3/121	XUS LTQ6A1130	3/105
XPE B110	4/23	XPE Z903	4/20	XPS MC32ZC	2/124	XSZ NCT03	3/121	XUS LTQ6A1215	3/105
XPE B111	4/23	XPE Z904	4/20	XPS MC32ZP	2/124	XSZ NCT10	3/121	XUS LTQ6A1305	3/105
XPE B211	4/23	XPE Z905	4/20	XPS MCCPC	2/125	XSZ NCT30	3/121	XUS LTQ6A1390	3/105
XPE B310	4/23	XPE Z911	4/20	XPS MCSCY	2/29	XSZ PCR05	3/115	XUS LTR5A0350	3/105
XPE B311	4/23	XPE Z912	4/20		2/125	XSZ PCR10	3/115	XUS LTR5A0520	3/105
XPE B510	4/23	XPE Z913	4/20	XPS MCTC16	2/124	XSZ PCR15	3/115	XUS LTR5A0700	3/105
XPE B511	4/23	XPE Z921	4/20	XPS MCTC32	2/124	XSZ PCR30	3/115	XUS LTR5A0870	3/105
XPE B611	4/23	XPE Z931	4/20	XPS MCTS16	2/124	XSZ PCT05	3/115	XUS LTR5A1045	3/105
XPE B711	4/23	XPS AC1321	2/175	XPS MCTS32	2/124	XSZ PCT10	3/115	XUS LTR5A1215	3/105
XPE G110	4/23	XPS AC1321P	2/175	XPS MCWIN	2/124	XSZ PCT15	3/115	XUS LTR5A1390	3/105
XPE G111	4/23	XPS AC3421	2/175	XPS MF1DI1601	2/78	XSZ PCT30	3/115	XUS LTR5A1570	3/105
XPE G211	4/23	XPS AC3421P	2/175	XPS MF2DO1601	2/85	XSZ SMK	3/126	XUS LTR5A1745	3/105
XPE G310	4/23	XPS AC3721	2/175	XPS MF2DO1602	2/85	XSZ SMK1	3/126	XUS LTR5A1920	3/105
XPE G311	4/23	XPS AC3721P	2/175	XPS MF2DO401	2/85	XSZ SMK2	3/126	XUS LTR5A2095	3/105
XPE G510	4/23	XPS AC5121	2/175	XPS MF2DO801	2/85	XSZ TCR05	3/106	XUS LZ100	3/106
XPE G511	4/23	XPS AC5121P	2/175	XPS MF3022	2/27	XSZ TCR10	3/106	XUS LZ213	3/106
XPE G611	4/23	XPS AF5130	2/187	XPS MF31222	2/27	XSZ TCR15	3/106	XUS LZ218	3/121
XPE G711	4/23	XPS AF5130P	2/187	XPS MF3502	2/27	XSZ TCR30	3/106	XUS LZ219	3/115
XPE G810	4/23	XPS AFL5130	2/191	XPS MF3522	2/27	XSZ TCT05	3/106	XUS LZ222	3/106
XPE G911	4/23	XPS AFL5130P	2/191	XPS MF3542	2/27	XSZ TCT10	3/106	XUS LZ227	3/126
XPE M110	4/20	XPS AK311144	2/201	XPS MF3AIO8401	2/97	XSZ TCT15	3/106	XUS LZ320	3/115
XPE M111	4/20	XPS AK331144P	2/201	XPS MF3DIO16801	2/97	XSZ TCT30	3/106	XUS LZ450	3/106
XPE M211	4/20	XPS AK351144	2/201	XPS MF3DIO20802	2/97	XUS LNG5C0150	3/121		3/115
XPE M310	4/19	XPS AK351144P	2/201	XPS MF3DIO8801	2/97	XUS LNG5C0300	3/121		3/121
XPE M3100D	4/19	XPS AK361144	2/201	XPS MF4000	2/12	XUS LNG5C0450	3/121	XUS LZ500	3/106
XPE M311	4/19	XPS AK361144P	2/201	XPS MF4002	2/12	XUS LNG5C0600	3/121		3/115
XPE M3110D	4/19	XPS AK371144	2/201	XPS MF4020	2/12	XUS LNG5C0750	3/121		3/121
XPE M329	4/19	XPS AK371144P	2/201	XPS MF4022	2/12	XUS LNG5C0900	3/121	XUS LZ500	3/70
XPE M410	4/19	XPS AR311144	2/195	XPS MF4040	2/12	XUS LNG5C1050	3/121	XUS LZ70260	3/107
XPE M510	4/19	XPS AR311144P	2/195	XPS MF4042	2/12	XUS LNG5C1200	3/121	XUS LZ70350	3/107
XPE M5100D	4/19	XPS AR351144	2/195	XPS MFADAPT	2/29	XUS LNG5C1350	3/121	XUS LZ70435	3/107
XPE M511	4/19	XPS AR351144P	2/195	XPS MFAI801	2/51	XUS LNG5C1500	3/121	XUS LZ70520	3/107
XPE M5110D	4/19	XPS AR371144	2/195	XPS MFAO801	2/53	XUS LNG5D0150	3/121	XUS LZ70610	3/107
XPE M529	4/19	XPS AR371144P	2/195	XPS MFBLK	2/45	XUS LNG5D0300	3/121	XUS LZ70700	3/107
XPE M611	4/19	XPS ATE3410	2/180	XPS MFCIO2401	2/55	XUS LNG5D0450	3/121	XUS LZ70785	3/107
XPE M6210D	4/19	XPS ATE3410P	2/180	XPS MFCPU22	2/44	XUS LNG5D0600	3/121	XUS LZ70870	3/107
XPE M711	4/19	XPS ATE3710	2/180	XPS MFDI2401	2/57	XUS LNG5D0750	3/121	XUS LZ70955	3/107
XPE M810	4/20	XPS ATE3710P	2/180	XPS MFDI3201	2/59	XUS LNG5D0900	3/121	XUS LZ71045	3/107
XPE M811	4/20	XPS ATE5110	2/180	XPS MFDIO241601	2/61	XUS LNG5D1050	3/121	XUS LZ71130	3/107
XPE M911	4/20	XPS ATE5110P	2/180	XPS MFD0801	2/63	XUS LNG5D1200	3/121	XUS LZ71215	3/107
XPE M929	4/20	XPS AV11113	2/180	XPS MFD0801	2/63	XUS LNG5D1350	3/121	XUS LZ71305	3/107
XPE R110	4/20	XPS AV11113P	2/180	XPS MFGEH01	2/44	XUS LNG5D1500	3/121	XUS LZ71390	3/107
XPE R111	4/20	XPS BA3420	2/211	XPS MFPS01	2/44	XUS LPB2A500M	3/113	XUS LZ71570	3/107
XPE R211	4/20	XPS BA3720	2/211	XPS MP11123	2/108	XUS LPB2A600M	3/113	XUS LZ71745	3/107
XPE R229	4/20	XPS BA5120	2/211	XPS OT3444	2/260	XUS LPZ1AB	3/114	XUS LZ71920	3/107
XPE R310	4/19	XPS BC1110	2/211	XPS OT3744	2/260	XUS LPZ1AM	3/113	XUS LZ72095	3/107
XPE R3100D	4/19	XPS BC3110	2/211	XPS PVK1184	2/255	XUS LPZ2A0500B	3/114	XUS ZA0102	3/124
XPE R311	4/19	XPS BC3410	2/211	XPS PVK3484	2/255	XUS LPZ2A0500M	3/113	XUS ZA0152	3/124
XPE R3110D	4/19	XPS BC3710	2/211			XUS LPZ2A0600B	3/114	XUS ZA0305	3/124
XPE R410	4/19					XUS LPZ2A0600M	3/113	XUS ZA0457	3/124
								XUS ZA0508	3/124

XUS ZA0610	3/124	XVB C2G●	4/54	XY2 CB34	4/8	XY2 SB76	4/31	ZB5 AS944	2/272
XUS ZA0711	3/124	XVB C2M●	4/54	XY2 CE1A250	4/7	XY2 SB90	4/32		4/39
XUS ZA0762	3/124	XVB C3●	4/53	XY2 CE1A270	4/7	XY2 SB93	4/32		4/40
XUS ZA0813	3/124	XVB C4B●	4/53	XY2 CE1A296	4/7	XY2 SB96	4/32		4/44
XUS ZA0914	3/124	XVB C4M●	4/53	XY2 CE1A297	4/7	XY2 SB98	4/32	ZB5 AS964	4/44
XUS ZA1016	3/124	XVB C5B●	4/54	XY2 CE1A450	4/7	XY2 SB99	4/32	ZB5 AT84	4/40
XUS ZA1067	3/124	XVB C5G●	4/54	XY2 CE1A470	4/7	XY2 TP1	3/89		4/44
XUS ZA1219	3/124	XVB C5M●	4/54	XY2 CE2A250	4/7	XY2 TP2	3/89	ZB5 AZ102	4/40
XUS ZA1321	3/124	XVB C6B●	4/55	XY2 CE2A270	4/7	XY2 TP3	3/89	ZB5 AZ104	4/40
XUS ZA1372	3/124	XVB C6G●	4/55	XY2 CE2A296	4/7	XY2 TP4	3/89	ZB5 AZ105	4/40
XUS ZA1422	3/124	XVB C6M●	4/55	XY2 CE2A297	4/7	XY2 TZ1	3/89	ZB5 AZ141	4/40
XUS ZA1524	3/124	XVB C8B●	4/55	XY2 CE2A450	4/7	XY2 TZ10	3/89	ZBY 2113	4/35
XUS ZA1626	3/124	XVB C8E5	4/55	XY2 CE2A470	4/7	XY2 TZ2	3/89		4/39
XUS ZA1830	3/124	XVB C8G●	4/55	XY2 CH13170	4/7	XY2 TZ20	3/89	ZBY 2230	4/35
XUS ZA2134	3/124	XVB C8M●	4/55	XY2 CH13250	4/7	XY2 TZ30	3/89		4/39
XUS ZA2134	3/124	XVB C9B	4/56	XY2 CH13253	4/7	XY2 TZ4	3/89		4/44
XUS ZC1200	3/127	XVB C9M	4/56	XY2 CH13258	4/7	XY2 TZ40	3/89	ZBY 2330	4/35
XUS ZC1800	3/127	XVB CY1	4/56	XY2 CH13270	4/7	XY2 TZ5	3/89		4/39
XUS ZC2100	3/127	XVB CY2	4/56	XY2 CH13273	4/7	XY2 TZ50	3/89		4/44
XUS ZC2400	3/127	XVB L0B●	4/51	XY2 CH13278	4/7	XY2 TZ60	3/89	ZBY 8130	4/35
XUS ZC3100	3/127	XVB L0G●	4/51	XY2 CH13350	4/7	XY2 TZ70	3/89		4/39
XUS ZCA	3/127	XVB L0M●	4/51	XY2 CH13370	4/7	XY2 TZ80	3/89	ZBY 8230	4/35
XUS ZCB	3/127	XVB L1B●	4/51	XY2 CH13450	4/7	XY2 TZ90	3/89		4/39
XUS ZM0102	3/124	XVB L1G●	4/51	XY2 CH13470	4/7	XZ CP0941L10	3/58	ZBY 8330	4/35
XUS ZM0152	3/124	XVB L1M●	4/51	XY2 CZ0024	4/12	XZ CP0941L2	3/58		4/39
XUS ZM0305	3/124	XVB L33	4/50	XY2 CZ0048	4/12	XZ CP0941L5	3/58	ZBY 9130	4/35
XUS ZM0457	3/124	XVB L34	4/50	XY2 CZ0130	4/12	XZ CP1041L10	3/58		4/39
XUS ZM0508	3/124	XVB L35	4/50	XY2 CZ0230	4/12	XZ CP1041L2	3/58	ZBY 9230	4/35
XUS ZM0610	3/124	XVB L36	4/50	XY2 CZ1015	4/11	XZ CP1041L5	3/58		4/39
XUS ZM0711	3/124	XVB L37	4/50	XY2 CZ102	4/11	XZ CP1141L10	3/58	ZBY 9330	4/35
XUS ZM0762	3/124	XVB L38	4/50	XY2 CZ105	4/11	XZ CP1141L●	3/58	ZEN L1111	4/44
XUS ZM0813	3/124	XVB L4B●	4/50	XY2 CZ110	4/11	XZ CP1241L●●	3/58	ZEN L1121	4/44
XUS ZM0914	3/124	XVB L4M●	4/50	XY2 CZ203	4/11	XZ CP29P11L●●	3/58		
XUS ZM1016	3/124	XVB L6B●	4/52	XY2 CZ301	4/11	XZ CP29P12L●●	3/70		
XUS ZM1067	3/124	XVB L6G●	4/52	XY2 CZ3015	4/11	XZC PTP0104L2	3/90		
XUS ZM1219	3/124	XVB L6M●	4/52	XY2 CZ302	4/11	XZC PTP0205L5	3/90		
XUS ZM1321	3/124	XVB L8B●	4/52	XY2 CZ305	4/11	XZC PTP0306L10	3/90		
XUS ZM1372	3/124	XVB L8G●	4/52	XY2 CZ310	4/11	XZC RTPA●	3/90		
XUS ZM1422	3/124	XVB L8M●	4/52	XY2 CZ402	4/11	<b>Z</b>			
XUS ZM1524	3/124	XVB Z0●	4/57	XY2 CZ404	4/11	Z01	5/15		
XUS ZM1626	3/124	XVR 012	4/61	XY2 CZ503	4/11	ZA2 BA639	4/12		
XUS ZM1830	3/124	XVR 013	4/61	XY2 CZ513	4/11	ZA2 BC64	4/12		
XUS ZM2134	3/124	XVR 015●	4/61	XY2 CZ523	4/11	ZA2 BP6	4/12		
XUS ZM2134	3/124	XVR 1B0●	4/61	XY2 CZ524	4/11	ZA2 BS062	4/12		
XUS ZWS0260	3/125	XVR 1G0●	4/61	XY2 CZ601	4/11	ZA2 BS06212	4/12		
XUS ZWS0350	3/125	XVR 1M0●	4/61	XY2 CZ602	4/11	ZA2 BV05	4/12		
XUS ZWS0435	3/125	XVS B●	4/63	XY2 CZ701	4/11	ZA2 BZ901	4/12		
XUS ZWS0520	3/125	XVS G●	4/63	XY2 CZ702	4/11	ZB2 BV015	4/12		
XUS ZWS0610	3/125	XVS M●	4/63	XY2 CZ703	4/11	ZB4 BR216	4/32		
XUS ZWS0700	3/125	XY2 AU1	4/27	XY2 CZ704	4/11	ZB4 BS834	4/36		
XUS ZWS0785	3/125	XY2 AU2	4/27	XY2 CZ705	4/11	ZB4 BS844	2/272		
XUS ZWS0870	3/125	XY2 AZ1	4/27	XY2 CZ708	4/11		4/32		
XUS ZWS0955	3/125	XY2 AZ2	4/27	XY2 CZ901	4/12		4/35		
XUS ZWS1045	3/125	XY2 AZ3	4/27	XY2 CZ902	4/12		4/36		
XUS ZWS1130	3/125	XY2 CB10	4/8	XY2 CZ902	4/12	ZB4 BS845S	4/32		
XUS ZWS1215	3/125	XY2 CB104	4/8	XY2 CZ903	4/12	ZB4 BS934	2/272		
XUS ZWS1305	3/125	XY2 CB11	4/8	XY2 CZ904	4/12		4/32		
XUS ZWS1390	3/125	XY2 CB12	4/8	XY2 CZ908	4/12		4/35		
XUS ZWS1570	3/125	XY2 CB13	4/8	XY2 CZ917	4/11		4/36		
XUS ZWS1745	3/125	XY2 CB14	4/8	XY2 CZ9310	4/11	ZB4 BS964	4/36		
XUS ZWS1920	3/125	XY2 CB20	4/8	XY2 CZ9315	4/11	ZB4 BT84	4/36		
XUS ZWS2095	3/125	XY2 CB204	4/8	XY2 CZ9325	4/11	ZB4 BZ10●	4/32		
XUS ZWSP	3/125	XY2 CB21	4/8	XY2 CZ9350	4/11		4/36		
XVB C07	4/56	XY2 CB21	4/8	XY2 CZ9525	4/11	ZB4 BZ141	4/36		
XVB C081	4/56	XY2 CB22	4/8	XY2 CZ9550	4/11	ZB5 AS834	4/40		
XVB C14	4/56	XY2 CB23	4/8	XY2 SB511	4/32		4/44		
XVB C21	4/56	XY2 CB24	4/8	XY2 SB531	4/32	ZB5 AS844	2/272		
XVB C21A	4/56	XY2 CB30	4/8	XY2 SB71	4/31		4/39		
XVB C21B	4/56	XY2 CB304	4/8	XY2 SB714	4/31		4/40		
XVB C22	4/56	XY2 CB31	4/8	XY2 SB72	4/31		4/44		
XVB C23	4/56	XY2 CB32	4/8	XY2 SB724	4/31	ZB5 AS934	4/40		
		XY2 CB33	4/8	XY2 SB75	4/31		4/44		